VOLUME THREE
CHINA—DUNSTAN

THE BRITISH
ENCYCLOPEDIA
IN TEN VOLUMES
ILLUSTRATED

THE BRITISH ENCYCLOPEDIA

ILLUSTRATED

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THREE

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KEY TO PRONUNCIATION

The method of marking pronunciations here employed is either (1) by marking the syllable on which the accent falls, or (2) by a simple system of transliteration, to which the following is the Key :

VOWELS

ā, as in *fate*, or in *bare*.

ä, as in *alms*, Fr. *âme*, Ger. Bahn = á of Indian names.

à, the same sound short or medium, as in Fr. *bal*, Ger. *Mann*.

a, as in *fat*.

ą, as in *fall*.

a, obscure, as in *rural*, similar to *u* in *but*, ė in *her* : common in Indian names.

ē, as in *me* = *i* in *machine*.

e, as in *met*.

ė, as in *her*.

ī, as in *pine*, or as *ei* in Ger. *mein*.

i, as in *pin*, also used for the short sound corresponding to ē, as in French and Italian words.

eu, a long sound as in Fr. *jeûne* = Ger. long *ö*, as in *Söhne*, *Göthe* (Goethe).

eu, corresponding sound short or medium, as in Fr. *peu* = Ger. *ö* short.

ō, as in *note*, *moan*.

o, as in *not*, *soft*—that is, short or medium.

ö, as in *move*, *two*.

ū, as in *tube*.

u, as in *tub* : similar to ė and also to *a*.

ų, as in *bull*.

ü, as in Sc. *abune* = Fr. *û* as in *dû*, Ger. *ü* long as in *grün*, *Bühne*.

u̇, the corresponding short or medium sound, as in Fr. *but*, Ger. *Müller*.

oi, as in *oil*.

ou, as in *pound* ; or as *au* in Ger. *Haus*.

CONSONANTS

Of the *consonants*, **b, d, f, h, j, k, l, m, n, ng, p, sh, t, v, z,** always have their common English sounds, when used to transliterate foreign words. The letter **c** is not used by itself in re-writing for pronunciation, **s** or **k** being used instead. The only consonantal symbols, therefore, that require explanation are the following :

ch is always as in ri*ch*.

d, nearly as *th* in *th*is = Sp. *d* in Ma*d*rid, etc.

g is always hard, as in *go*.

h represents the guttural in Scotch lo*ch*, Ger. na*ch*, also other similar gutturals.

ṇ, Fr. nasal *n* as in bo*n*.

r represents both English *r*, and *r* in foreign words, which is generally much more strongly trilled.

s, always as in *so*.

th, as *th* in *th*in.

th, as *th* in *th*is.

w always consonantal, as in *we*.

x = ks, which are used instead.

y always consonantal, as in *y*ea (Fr. *ligne* would be re-written lĕny).

zh, as *s* in pleasure = Fr. *j*.

THE BRITISH ENCYCLOPEDIA

VOLUME III

CHINA. An immense Republic stretching from the centre of Asia, about 74° E. long., for 3000 miles to the east coast of Korea, in 135° E. long.; and from the Siberian frontier at the River Amur, about 54° N. lat., for 2400 miles southwards to the Island of Hainan. This vast Republic, second in magnitude only to the British Empire, has an area of 2,446,855 sq. miles, and a population estimated at approximately 474,487,000, and is usually divided into China Proper; the new dominion of Sinkiang; and the dependencies of Manchuria, Fengtien or Liaoning, Kirin, Heilungkiang, Mongolia, and Tibet. Tibet is practically autonomous, although controlled in its foreign relations by the Chinese Government. Korea (q.v.) previous to 1894 acknowledged the suzerainty of China. The dependencies, though they cover an area of 2,194,500 sq. miles, contain but a small and relatively unimportant part of the population (about 27,840,819), China Proper being the centre of power and population. According to the estimation of the customs authorities, the population of the entire Republic in 1931 was 474,487,000.

China Proper, known to Marco Polo and earlier travellers by the Tartar name of *Cathay*, called "Middle Kingdom" by the Chinese, comprises the following provinces (as table shown at top of next column).

	Area in sq. miles.	Population.	Capital.
Chili .	115,830	38,905,695	Peiping.
Shantung .	55,984	34,375,849	Tsinan.
Shansi .	81,853	12,153,127	Tai-yuan.
Honan .	67,954	35,289,762	Kaifeng.
Kiangsu .	38,610	34,624,433	Chinkiang.
Anhwei .	54,826	20,198,840	Anking.
Kiangsi .	69,498	27,563,410	Nanchang.
Chekiang .	36,680	24,139,766	Hangchow.
Fukien .	46,332	14,329,594	Foochow.
Hupeh .	71,428	28,616,576	Wuchang.
Hunan .	83,398	40,529,988	Changsha.
Shensi .	75,290	17,222,571	Sian.
Kansu .	125,483	7,422,818	Lanchow.
Szechwan	218,533	52,063,606	Ch'engtu.
Kwangtung	100,000	36,773,502	Canton.
Kwangsi .	77,220	12,258,335	Kuelin.
Kweichow	67,182	11,291,261	Kuei-yang.
Yunnan .	146,714	11,020,591	Yünnan.
	1,532,815	458,779,714	

Note.—In dealing with China, no statistics can be regarded as more than estimates. This applies particularly to populations.

Physical Features.—Great part of the country is not well known. The coast-line forms an irregular curve of about 2250 miles. It is not deeply penetrated by gulfs, the only one of great extent being that of Chihli in the north-east, but numerous indentations of sufficient dimensions to form safe and capacious roadsteads are found in every quarter. It is characterized by a fringe of islands and islets, the largest of which are Formosa (Taiwan) and Hainan. The Gulf of Chili, the Yellow Sea, and the China Sea wash the eastern and south-eastern shores, and are characterized by the destructive storms called *typhoons*.

The inland boundaries are formed mainly by Tongking, Burma, Tibet, and, on the north, partly by the Great Wall separating China from Mongolia, one of the most remarkable of human structures, being an artificial barrier 1500 miles long, begun in the third century, and added to in course of years down to the sixteenth century. Two-thirds of the interior are estimated to be mountainous. The general slope is from west to east, and the mountains are a continuation of those of Tibet and Central Asia.

The great Kwen Lun range throws off branches, the Tsin-ling-shan, Funiu-shan, and Mu-ling, which, running eastward between the great valleys of the Hwang Ho and Yangtse Kiang, traverse almost the whole breadth of China. Farther north the Nan-shan branch of the Kwen Lun range runs under various names (Kuliang, Alashan, Inshan, etc.) along the north-east of China till it reaches

the frontier of Manchuria, north of Peiping. The third great mountain system of China is in the south-east, where extensive chains such as the Nan-shan, the Ta-yu-ling, and Pu-ling stretch on the south side of the Yangtse Kiang all the way from the

sisting generally of a deep alluvial soil of unparalleled fertility. As they approach the sea-coast the two rivers are connected by the Grand Canal, 700 miles in length, thus completing a magnificent system of inland navigation. The Hwang Ho

[N.S. Geogs.

MAP OF CHINA
The dotted line shows how Ichang is the centre of China.

highlands of Yunnan to the eastern seaboard. Between these mountain systems, and following courses which may be roughly described as parallel, run the two great rivers of China, the Hwang Ho and the Yangtse Kiang. Here lie the central and richest provinces of China.

On both sides of the lower Hwang Ho is an immense delta plain, con-

has changed its lower course several times, and is subject to tremendous and disastrous floods. Besides these rivers and their numerous tributaries, the most deserving of notice are the Sikiang in the south, of considerable size, but still more commercial importance, having at or near its embouchure Canton, Hong-Kong, and Macao; and the Pei-ho,

which, though much smaller, forms a water-way between Peiping and the Gulf of Chili.

There are a number of lakes, mostly of no great size; the largest is Tung-ting, near the centre of China, with a circumference of about 270 miles. A remarkable feature of the surface of Northern China is the deposit of *loess*, a brownish-yellow earth of great fertility, which covers an immense area both of mountain and valley, and enables agriculture to be successfully carried on at the height of 7000 or 8000 feet.

Climate.—The greater part of China belongs to the temperate zone, but it has what is called an excessive climate. At Peiping in summer the heat ranges from 90° to 100° in the shade, while the winter is so cold that the rivers are usually frozen from December to March. At Shanghai, lat. 31° 20′, the maximum temperature reaches 100°, and the minimum falls at least to 20° below freezing-point (12° F.). In the south the climate is of a tropical character, the summer heat rising to 120°. Here the south-west and north-east monsoons blow with great regularity, and divide the year between them.

Among the greatest scourges of the country are the dreadful gales known as typhoons, from the Chinese *Ta-fung*, or "great-wind." They never fail to commit great devastation, though happily they always give such timely notice of their approach that preparations can be made. The Hwang Ho and Yangtse Kiang basins have a pretty equable temperature, due to the soft moist winds of the Pacific.

Productions.—China is well supplied with minerals, including gold, silver, copper, iron, and other metals, and there are very extensive coal-fields (the area of one of these in the province of Hunan being about 21,000 sq. miles). Copper is mined in Yunnan, and antimony in Hunan. Petroleum is being developed in the upper Yangtse region. Salt is abundant, and there are inexhaustible beds of kaolin, or porcelain earth. Among animals it is difficult to mention any that are characteristic of the country; many of them are identical with or differ but little from those of Europe. In the south and south-west the tiger, the rhinoceros, and elephant are found; bears are common in many parts; other carnivora are the wild-cat, badger, lynx, and marten.

Camels and elephants are used in a domestic state, but the chief domesticated animal is the buffalo. The horses are of a poor breed. Among birds the most beautiful are the gold and silver pheasants. Fish swarm in all inland waters as well as on the coast, the natural supply being immensely increased by artificial means. As regards the flora of China, it is tropical in the south (coco and sago palms, banana, and pandanus), subtropical farther north, and still farther north prevails a number of plants and trees identical with or closely akin to those of middle Europe.

Flowering plants, shrubs, and trees are exceedingly abundant. The bamboo, on account of its extreme usefulness, is one of the most valuable trees. Oaks, the chestnut, hazel, pines, yew, and walnut are among forest trees. Wax and camphor trees abound. Azaleas are exceedingly numerous; other flowering plants are the camellia, rose, passion-flower, cactus, and lagerstrœmia. Fruits are abundant and varied. The soil, especially of the country comprising the two great river basins, is extremely fertile, and agriculture has always been considered important in China.

The land is all freehold, held by families on the payment of an annual tax. Rice, as the principal food of the people, is the staple crop in the centre and south. The rich alluvial plains which cover a great part of the surface are admirably adapted for its culture, and by careful management yield amazing crops. In the north there is a variety called dry-soil rice, which is cultivated like any other cereal. Wheat, barley, and millet are the other chief grain crops. Other crops are maize, buckwheat, a great variety of beans, pease, and pulse generally, sugar-cane, tobacco, and vegetables in endless variety, including potatoes and turnips, and at the ports the best European and American vegetables.

Varieties of the cabbage tribe are extensively cultivated for the oil extracted from the seeds. Three plants of the greatest economical importance to China are the mulberry, cultivated to provide food for silk-worms, cotton, and tea, the last for long regarded as exclusively a Chinese product. Another important crop is the opium poppy, which was extensively grown, though the product is inferor to that of India. In consequence, however, of the anti-opium decree of 1906, the cultivation of the poppy has been rapidly restricted. In 1911 an agreement with the British Government was signed whereby import of Indian opium into China was to be reduced in the same proportion as the diminution of the cultivation of native opium, the importation and cultivation to cease in 1917.

Manufactures.—Manual labour is still preferred to machinery in China,

though there are now great cotton- and wool-mills and silk filatures in Canton, Shanghai, and elsewhere. Among the chief industries is the silk manufacture, which produces some varieties of stuffs unsurpassed anywhere. Everybody wears silks; it is the prescribed attire of high officers. The finer kinds of it form the ordinary dresses of the opulent, while the poorest manage to deck themselves in coarser, if not on common, at least on gala days. The embroidery of silk is carried on to an amazing extent. Cotton goods are also largely made, though great quantities of European and American manufactures are also imported. Flax is not grown, but a good substitute for it is found in the fibres of two or three plants, from which the beautiful grass-cloth, similar in appearance to linen, is extensively woven. Woollens are made only to a limited extent.

The porcelain of China has been famous from the earliest periods, and the manufacture of the finest forms of it was long known to the Chinese alone. In lacquered ware the Chinese continue unsurpassed. In working in metals they have only attained to mediocrity. The metallic products most deserving of notice are their hand-turned brass work, which is unique, gongs, mirrors, statuettes in copper and bronze, and various kinds of carved, chased, and filigree work, both in gold and silver. In a great number of minor articles the workmanship is exquisite—fans, card-cases, seals, combs, chess-men of wood, ivory, mother-of-pearl, and tortoise-shell. Paper is made of a great variety of substances, and the art of making it—like various others—was practised in China long before Europe acquired it.

Commerce.—The inland trade of China, aided by its vast system of water communication, is of incalculable magnitude, the rivers and canals literally swarming with junks, barges, and boats of all sizes. Roads, however, are few and bad, and railways have as yet only a length of 12,335 miles (excluding 1857 miles in Manchuria), of which 1300 have been constructed by British enterprise and capital. There were 2000 miles under construction in 1927. The first railroad was built in 1876, from Wu-sung to Shanghai. Telegraphs have made more progress, and are being rapidly extended all over the country, the lines having a length of 52,050 miles. By the edict of Nov., 1906, the control of the postal service was transferred to the Ministry of Communications, and the transfer was effected in 1911. By the opening of the "Treaty" ports and other ports (64 in number), the foreign commerce has been immensely increased. The chief of these ports are Shanghai (by far the first), Canton, Hankow, Swatow, Tientsin, Ningpo, Amoy, Newchwang, Foo-chow.

Exports.—The main articles of export are silk (which has by far the greatest value), beans and bean-cake, oils, raw cotton, and tea (which was at one time the most valuable export, but which has steadily declined owing to Indian and Ceylonese competition). The main imports are cotton goods, metals and metal goods, and various manufactured articles. Among the countries trading with China the principal are Japan, the United States, Great Britain, India, France, and Germany. The total exports in 1931 were valued at £94,984,984, and the total imports at £152,795,295. Of the exports about £12,783,664 represented silks. The import of opium is now only about 2000 lb., compared with 2,928,793 lb. in 1912. The import of Indian opium is now prohibited. In 1931 China imported from Britain goods valued at £7,973,498, and exported to Britain goods valued at £7,751,770. The export of tea, which was 248,758,000 lb. in 1895, had fallen to 112,000,000 lb. in 1926, of which 13,500,000 lb. went to Britain, and to 92,539,733 lb. in 1930, of which 8,740,961 lb. went to Britain. The most valuable export to Britain is egg-yolk (£3,375,606 in 1930).

A uniform system of weights and measures was introduced on 9th Oct., 1907. Among the standards of weight used are the *liang* or *tael*=1⅓ oz. avoirdupois; the *catty*=1⅓ lb.; and the *picul*=133⅓ lb. The *chih* of 14⅛ inches is the standard measure of length; a measure of distance is the *li*=⅓ mile. There are no national gold or silver coins. The usual money unit is the *Haikwan tael*, the value of which varies with that of silver; in 1913 it was 3*s.* 0½*d.*; in 1914, 2*s.* 8⅜*d.*; in 1926, 3*s.* 1*d.*; in 1930, 1*s.* 10⅜*d.*; and in 1931, 2*s.* 1⅜*d.* A gold currency scheme promulgated in 1918 has been postponed. Private bankers are found in all large towns. By the law of May, 1910, the several mints have been brought under the Central Government, and are no longer private ventures. The Bank of China was established in 1913, and a Government savings bank was opened on 23rd Oct., 1914. Standardized banking terms were adopted throughout the country for the first time in 1924.

People.—The Chinese belong to the Mongolian race, but in them its harsher features, as represented in

the genuine Tartars, are considerably softened. It would, however, be a great mistake to think that the Chinese people are all of one race. The true Chinamen, that is to say, the natives of the central provinces, differ greatly from their countrymen of the maritime provinces. The ordinary Chinamen are generally of low stature, have small hands and feet, a dark complexion, a wide forehead, black hair, eyes and eyebrows obliquely turned upwards at the outer extremities. To compress the feet of the females is far from being a universal custom, and most of the southern women do not treat their feet in this unnatural way. The queue (pien-tze) worn by the Chinese was introduced by Manchu conquerors in 1627.

In bodily strength they are far inferior to Europeans, but superior to most Asiatics, and their great assiduity and patient endurance of fatigue make them valuable as labourers. They are considered to be deficient in courage. In their moral qualities there is much that is amiable. They are strongly attached to their homes, hold age in respect, toil hard for the support of their families, and in the interior, where the worst kind of foreign intercourse has not debased them, exhibit an unsophisticated simplicity of manners which recalls the age of the patriarchs. In the great mass these qualities are counterbalanced, or rather supplanted, by numerous vices—treachery, lying, and various others.

The Chinese use great politeness in their intercourse with each other; but there is perhaps a want of frankness and sincerity. They scrupulously avoid all contradiction and offensive expressions in conversation. Gambling is a universal vice. Drunkenness has hitherto been rare amongst them, but opium-smoking (now repressed by law) is common. But, with many vicious characteristics, the Chinese are preserved from degeneration by their universal frugality and thrift. Hard work, done in the most uncomplaining way, has become second nature with them. Filial piety is also a striking feature of their character, and is, in fact, the principle upon which Chinese society is constituted. They have chambers set apart for the worship of their ancestors, where religious ceremonies are regularly performed.

Language, Religion, etc.—The Chinese is the most important and most widely spread of the so-called monosyllabic languages of Eastern Asia, in which each word is uttered by a single movement of the organs of speech. There is no alphabet, each word being represented by a single symbol or character. These written characters appear to have been originally hieroglyphics or rude copies of the objects designed to be expressed by them; but the hieroglyphic features have almost entirely disappeared, and many of the symbols are formed of what seems to be an arbitrary combination of lines, or are built up of other symbols combined.

In writing or printing, the characters are arranged in vertical columns, to be read from top to bottom. The art of making paper is said to have been known in the first century after Christ, and printing from wooden blocks in the seventh or eighth century, hundreds of years before these valuable arts were re-invented in Europe; and the Chinese literature is now very extensive. There are great numbers of treatises on almost all subjects—science, history, geography, belles-lettres, and poetry; literary eminence is the sure avenue to the highest honours and offices of the State, and hence "the *literati* are the gentry, the magistrates, the governors, the negotiators, the ministers of China."

Among the moderately well-to-do classes education of the kind which promises to be best rewarded is almost universal, and in every village there are schools for the lower classes. The old system of a purely Chinese type of education was swept away by a decree of 1905. Numerous schools for teaching Western learning were established. The Peiping University was established in 1898, and the medical school was founded in 1906. There are ten State universities. A large number of young Chinese study in the United States, Europe, and Japan. There is a modern university with British professors at Hong-Kong. Some 167,176 educational institutions of all grades are to be found in China, with an aggregate enrolment of 5,814,375 pupils.

The chief religions in China are Confucianism, Taoism, and Buddhism, the last introduced subsequently to the others. The religion of the learned is that founded by Kong-Fu-Tse or Confucius, about 550 B.C. Taoism, founded by Laotze, is a compound of mystical and superstitious elements. But amongst the great mass of the people a form of Buddhism prevails, or a sort of mixture of the other religions. Whatever be the importance of these three religions, they are insignificant as compared with the real, national religion of all the Chinese—ancestor-worship.

In the western parts Mohammedanism has many followers, estimated at 20,000,000. The most important Christian missions are those of the French Roman Catholics, who have been longest in the country, and have numerous stations. Various Protestant bodies also carry on missionary operations in China since 1807. The Protestant converts number about 189,794, while the Roman Catholic missions claim 2,486,841 adherents. Jews have been settled in China since A.D. 69. (See JEWS.) In 1913 the Chinese Republic adopted the calendar of Western Europe.

Ancient Chinese Soldier.

Government, Administration, etc.—The government was for centuries an absolute despotism. The reigning dynasty was for 267 years of Manchu Tartar blood. The emperor united in his person the attributes of supreme magistrate and sovereign pontiff, and as the "Son of Heaven" was in theory accountable only to heaven. A Republic, however, was established on 12th Feb., 1912, on the abdication of the five-year-old emperor Pu-yi, dethroned by the revolution of 1911-12. A provisional Constitution was promulgated, and in 1923 this was replaced by a new Constitution. In 1924, however, General Feng Yü-hsiang carried out a *coup d'état* and set up an autocratic government. A series of Regency Cabinets followed till 1927, when this makeshift régime was replaced by a military government, the power being in the hands of a Generalissimo, assisted by a Cabinet chosen by himself. This is the Peiping government.

The National Government has its seat at Nanking. This Nationalist Government is a Committee Government, appointed by the Central Executive Committee of the Kuomintang (i.e. the Nationalist Party). Since 1928 it has had control of the greater part of China. It is revolutionary and is based on its founder's (Sun Yat-Sen) Three Principles: Nationalism, Democracy, and State Socialism. It promulgated a Constitution in 1928, and as it is progressive and has lost most of its former extremism, it would seem that in it is the hope of China. The Peiping government has been practically suppressed, and, though there are independent military governments in some of the provinces, these tend to become nationalist. The civil wars which have been raging since 1921 have completely disorganized the country.

History.—The early history of the Chinese is shrouded in fable, but it is certain that civilization had advanced much among them when it was only beginning to dawn on the nations of Europe. The Chow dynasty, which was founded by Woo-wang, and lasted from about 1100 B.C. to 258 B.C., is perhaps the earliest that can be regarded as historic, and even of it not much more is historic than the name. Under Ling-wang, one of the sovereigns of this dynasty, Confucius is said to have been born, some time in the sixth century B.C.

During the latter half of the period during which this line of sovereigns held sway, there appears to have been a number of rival kings in China, who lived in strife with one another. Chow-siang, who was the founder of the Tsin dynasty, from which China takes its name, gained the superiority over his rivals, and died in 251 B.C. His great-grandson, a national hero of the Chinese, was the first to assume the title of "Hoang" (emperor), and called himself Che-Hoang-ti. He ruled over an empire nearly conterminous with modern China Proper.

In his reign the Great Wall (see next article), designed as a protection against marauding Tartars, was begun in 214 B.C. Buddhism was introduced in A.D. 65. Subsequently the Empire

broke up into three or more states, and a long period of confusion and weak government ensued. In 960 a strong ruler managed to consolidate the Empire, but the attacks of the Tartars were now causing much trouble. In the thirteenth century the Mongols under Jenghis Khan and his son Ogdai conquered China, and in 1259 the celebrated Kublai Khan, a nephew of the latter, ascended the throne and founded the Mongol dynasty. His ninth descendant was driven from the throne, and a native dynasty called Ming again succeeded in 1368 in the person of Hungwu.

A long period of peace ensued, but was broken about 1618, when the Manchus gained the ascendancy, and, after a war of twenty-seven years, founded the last reigning Tartar dynasty in the person of Tungchi, establishing their capital in the northern city of Peking, which was nearer their native country and resources than the old capital Nanking. The earliest authentic accounts of China published in Europe are those of Marco Polo, who visited the country in the thirteenth century. The first British intercourse was attempted under Queen Elizabeth in 1596, and a trade was subsequently established by the East India Company, but no direct intercourse between the Governments took place till the embassy of Lord Macartney in 1792. A second embassy in 1816, by Lord Amherst, was treated with insolence; and subsequently the treatment of British merchants became such that a collision was inevitable.

In 1840 the British, on being refused redress for injuries, proceeded to hostilities, and a treaty was concluded (1842), by which the five ports of Canton, Amoy, Foo-chow-foo, Ningpo, and Shanghai were opened to British merchants, and the Island of Hong-Kong ceded to the British in perpetuity. In 1850 an insurrection, headed by Hung-seu-tseuan or Tien-te, broke out in the provinces adjoining Canton, with the object of expelling the Manchu dynasty from the throne, and of making Tien-te the founder of a new dynasty, which he called that of Tai-ping, or Universal Peace. The Tai-ping rebellion was suppressed in 1865, largely by the exertions of Gordon, at that time a major. The seizure by the Chinese of the crew of a Hong-Kong vessel in 1856 led to a war in which the French joined the British.

After Peking was taken (in 1860) the Chinese Government granted a treaty securing important privileges to the Allies. In 1894 war broke out with Japan, and in this short struggle Japan had almost uninterrupted success both by sea and land, having driven the Chinese out of Korea. Peace was concluded in 1895, China agreeing to give up Formosa. In 1897 Germany seized the port of Kiao-Chow (Tsingtao), which was restored to China in 1922. In 1898 Russia obtained a lease of Port Arthur and Talienwan (both now Japanese); and in the same year Britain claimed and obtained a lease of Wei-hai-wei, which was returned to China in 1930. In 1900 an anti-foreign movement broke out in North China, mainly instigated by a secret society (the Boxers). Native Christians and European and other missionaries were murdered; and for a time the Europeans in Peking were in danger of being massacred.

An international force, however, succeeded in effecting their rescue. In 1911, a revolution broke out which resulted in the establishment of a Republic in Feb., 1912. Canton declared its independence in 1921, and troubles broke out in consequence of the election of Sun Yat-Sen as President. Since then civil wars have been constant. At the end of 1925 the trouble became serious, and a great civil war between the Southern (Canton) and the Northern (Peking) forces began. Sun Yat-Sen died in 1925, and in 1926 his party, the Kuomintang (Nationalist party), revived, and with Russian help proceeded against the Northern armies. Many nationalists, however, resented the Russian domination of their party, and in 1927, the moderates under Chiang K'ai-shek set up a Government in Nanking in opposition to the communist government in Wuhan.

To protect British life and property, Britain sent a large defence force to Shanghai in 1927. By the end of 1927 the Russian advisers were being driven from the country, and early in 1928 the Nationalist party was united again and reorganized under moderate leaders, with headquarters at Nanking. The advance against the Northern forces recommenced, and Peking was captured. Nanking became the capital of the Chinese Republic, and Chiang K'ai-shek became president of the Nationalist Government. Throughout 1929 and 1930 the Nationalist Government consolidated its position, received recognition as the Central Government of China, and revised the treaty relations with foreign countries.

In 1931 and 1932 there was much trouble with Japan over that country's seizure of Chinese territory in Manchuria, and in 1932 the League

of Nations appointed a commission under the chairmanship of Lord Lytton to inquire into the dispute. Meantime Manchuria was declared to be a republic under Japanese protection (*see* MANCHURIA). The Lytton Commission report was a serious indictment of Japan, which, however, refused to accept the League proposals and threatened to resign from the League. Early in 1933 a Sino-Japanese War broke out. *See* MANCHURIA ; MONGOLIA ; TIBET ; etc.—BIBLIOGRAPHY : *The China Year Book* ; J. Arnold, *Commercial Handbook of China* ; R. K. Douglas, *China* ; Sun Yat-Sen, *The International Development of China* ; *Chinese Imperial Maritime Customs Reports* ; Julia E. Johnsen, *China and Japan* (*a Bibliography*) ; L. M. King, *China in Turmoil*.

CHINA, Great Wall of. An artificial barrier extending for about 1500 miles in the north of China Proper, of which it partly forms the boundary. Its western end is in the deserts of Central Asia ; its eastern reaches the sea to the north-eastward of Peking. It was erected as a barrier against the inroads of the barbarous tribes, and dates from about 214 B.C. It is carried over height and hollow, and avoids no inequality of the ground, reaching in one place the height of over 5000 feet above the sea. Earth, gravel, brick, and stone were used in its construction, and in some places it is much more substantial than in others. Its greatest height, including the parapet on its top, is about 50 feet, and it is strengthened by towers at regular distances. The wall is still intact for hundreds of miles, although here and there the granite and brick have fallen away. It has been cut through near Kalzan to admit the railway line from Peking.

CHINA ASTER. The common name of *Callistephus hortensis*, a composite plant, hardy and free flowering.

CHINA-CLAY. *See* KAOLIN.

CHINA GRASS. *See* BŒHMERIA.

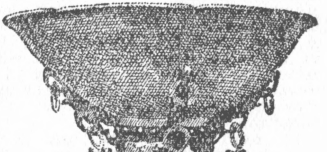
CHINA INK. A black solid which, when rubbed down with water, forms a very pure black indelible ink. It has been used in China from time immemorial. There are different accounts of the process, but it appears to be made by boiling the juices of certain plants with water to a syrup, adding to this a quantity of gelatine, and incorporating the product with carbonaceous matter. There is generally added some perfume—a little musk or camphor. The mass is then made into square columns of different sizes, which are often decorated with figures and Chinese characters.

Many attempts have been made to imitate Chinese ink, some of which have been tolerably successful. Good Chinese ink should have a velvety-black appearance, with a gloss which becomes very conspicuous on rubbing. The colour it gives on paper should be pure black and homogeneous, and if water be passed over it it should not run or become streaky. It is indelible by ordinary solvents, but may be removed sometimes mechanically.

CHINANDEGA (chē-nän-dā'gȧ). A town of Central America, Nicaragua, 20 miles N.W. of Leon, connected by railway with the port of Corinto, and carrying on a considerable trade. Pop. 12,000.

CHINA ROSE. The name given to a number of varieties of garden rose chiefly derived from *Rosa indica* and *R. semperflorens*, both natives of China. Also a name sometimes given to *Hibiscus Rosa sinensis*, one of the mallow tribe, common in China and the East Indies, and an ornament in hot-houses.

CHINA-WARE. Porcelain, the finest and most beautiful of all the



Chinese Porcelain. King-te-chen

Imperial porcelain bowl. Mark of the Yung-Lo period, A.D. 1403–25. From the original in the British Museum.

kinds of earthenware, so called from China being the country which first supplied it to Europeans. The Chinese are said to have manufactured porcelain previous to the Christian era, but it was not till five or six centuries later that they attained any great perfection in the art. Japan also appears to have been early acquainted with the manufacture. In the beginning of the sixteenth century the ware was first introduced into Europe, and won immediate popularity by its beauty and novelty. For long it was thought impossible to fabricate anything similar in

Europe, but at length John Frederick Böttcher or Böttiger, a native of Saxony, who had long devoted himself to alchemy, discovered a means of producing a porcelain equal in whiteness to that of China. This led to the establishment by the Government of the far-famed porcelain manufactory at Meissen, near Dresden. The Saxon porcelain soon became celebrated over Europe, and rivalled that of China in the excellence of its quality and the beauty of its decorations. Subsequently porcelain works were established at Vienna, and at Munich, and elsewhere in Germany.

In France also about the middle of the eighteenth century the celebrated factory at Sèvres was set up and soon acquired a great renown. In England a porcelain work was established at Chelsea some years prior to 1745; it was made at Stratford-le-Bow about the same time, at Derby as early as 1750, at Worcester in 1751. About 1755 kaolin or porcelain clay was discovered in Cornwall, and this contributed greatly to improve the quality of English porcelain, which began to be largely manufactured in Staffordshire under the auspices of Josiah Spode and Thomas Minton.

China-ware, when broken, presents a granular surface, with a texture compact, dense, firm, hard, vitreous, and durable. It is semi-transparent, with a covering of white glaze, clear, smooth, unaffected by all acids excepting hydrofluoric acid, and resisting uninjured sudden changes of temperature. For the process of manufacture, *see* POTTERY.

CHINCH. The popular name of certain fetid American insects, genus Rhyparochrōmus, resembling the bed-bug, very destructive to wheat, maize, etc., in the southern and western states. Also applied to the common bed-bug (*Cimex lectularius*).

CHINCHA ISLANDS (chin'chä). A group of small islands off the coast of Peru, lat. 13° 48′ S.; long. 76° 30′ W. They are granitic, arid, and destitute of vegetation, and the coasts bold and difficult of access. Immense deposits of guano used to exist here, but are now exhausted. Guano from these islands began to be imported into Europe on an experimental scale about 1832, and the trade rapidly grew into importance. The Peruvian Government retained the monopoly of the export, and made it one of the chief sources of its revenues.

CHINCHIL'LA. A genus of South American herbivorous rodents, including a single species (*C. lanigera*), which is a small squirrel-like form, native to the high Andes. Its beautiful pearly-grey fur is of great value.

Chinchilla (*Chinchilla lanigera*)

CHINCHILLA (chin-chĕl'yä). A town of Spain, Murcia, in the province of Albacete, and 10 miles S.E. of the town of that name, on a rocky eminence, substantially built and surrounded by ancient walls flanked with towers. Pop. 7320.

CHINCHONA (chin-chō'nä). *See* CINCHONA.

CHINDE (chin'dā). A Portuguese town on the East African coast, on the only navigable mouth of the Zambesi, where the inland steamers meet the ocean steamers, being thus a considerable seat of trade. Pop. 1690.

CHINESE GLUE. A superior glue and varnish obtained from a species of seaweed which abounds on the shores of China. When once dried it resists the action of water.

CHINESE WHITE. The white oxide of zinc, a valuable pigment introduced into the arts as a substitute for the preparations of white lead. It is non-poisonous.

CHINGFORD. A municipal borough of England, in Essex, near the western border of the county, and a short distance from Epping Forest, which attracts many visitors to the town. Pop. (1931), 22,051.

CHING-HAI. A seaport in China, province of Che-kiang, at the mouth of the river leading to, and 9 miles N.E. of Ningpo.

CHING'LEPUT (ching'gl-put), or **CHENGALPAT.** A coast district, and

its capital, India, Presidency fo Madras. The district, which lies south of Arcot and Madras—area, about 3079 sq. miles—has generally a bad soil, broken up frequently by granite rocks. Pop. 1,406,000. This tract of country was in 1750 and 1763 obtained by the East India Company from the Nabob of Arcot. The town is 15 miles W. of the Bay of Bengal, and 35 miles S.S.W. of Madras, and has a pop. of 11,600.

CHIN'IOT. A town of India, in the Punjab, near the Chenab. Pop. 13,475.

CHINK'APIN. The American dwarf chestnut.

CHIN-KIANG, or TCHANG-KIANG. A city, China, province of Kiangsu, right bank of the Yangtze Kiang, near the junction of the Imperial Canal; one of the treaty ports, advantageously situated for trade, which it carries on to the value of several millions sterling a year. In 1842 it was taken by the British, after a determined resistance on the part of the Manchu garrison. It suffered severely in the Tai-ping rebellion. Pop. 153,613.

CHINOLINE. *See* QUINOLINE.

CHINON (chē-nōn). A town in France, department of Indre-et-Loire, on the Vienne, 28 miles S.W. of Tours. Rabelais was born in its vicinity. Pop. 5943.

CHINOOK WINDS. Warm winter winds from the Pacific in parts of the north-western United States and Western Canada. The name was given to these winds because they blew from the territory occupied by the Chinook Indians.

CHINSU'RAH. A town in India, 20 miles N. of Calcutta, beautifully situated on the Hugli, closely adjoining the town of Hugli, and now included in its municipality. It is a military station, was formerly a Dutch settlement, and contains many neat houses in the Dutch style. Pop. (with Hugli), 29,383.

CHINTZ. Cotton cloth or calico printed with flowers or other devices in various colours, and now generally glazed.

CHIN-WANG-TAO. A treaty port, China, province of Chihli.

CHIOGGIA (ki-od'jà). A seaport town of Italy, on one of the lagoon islands of the Adriatic, 15 miles from Venice. In antiquity it was known as Fossa Clodia, in the Middle Ages as Clugia. It is built partly on piles, and has some handsome edifices. Its harbour is fortified, and it has shipbuilding yards, fisheries, and a coasting trade. Pop. 36,100.

CHIONODOXA. A genus of bulbous herbs, nat. ord. Liliaceæ, natives of Mediterranean countries. *C. luciliæ* ("glory of the snow," a translation of the generic name) has lately become a popular garden bulb on account of its pretty blue flowers, which appear early in spring.

CHIOS, or SCIO (ki'os, or she'o). An island belonging to Greece, in the Ægean Sea, separated from the coast of Asia Minor by a channel not more than 5 miles wide where narrowest, and about 53 miles W. of Smyrna. It is of a somewhat quadrangular form, 32 miles long from north to south, with a mean breadth of about 12 miles; area, between three and four hundred square miles. The surface exhibits a number of limestone ridges, separated from each other by verdant and fertile valleys, and reaching a height of 4000 feet. There are no perennial streams; but an abundant supply of water is obtained from wells. The principal products are wine, oil, cotton, silk, oranges and other fruits, leather, antimony, zinc, marble, and mastic. Very little grain is produced. Pop., of whom a large portion are Turks, about 75,680.

Before the War of Greek Independence, Chios was peopled almost entirely by Greeks, of whom large numbers were massacred by the Turks after their subjugation in 1822. Chios contends for the honour of having given birth to Homer. It possesses few antiquities. In April, 1881, the island suffered much from earthquake shocks. The capital is Chios. Pop. 40,000.

CHIP'MUNK, or CHIP'MUCK. The popular name in America of the ground-squirrel, genus Tamias.

CHIPPENDALE, Thomas. A famous London cabinet-maker, who flourished about 1750-79, and published in 1752 the first edition of a book containing designs for furniture (*The Gentleman and Cabinet Maker's Director*). His style was based on that of France, and was more florid than that of his successor, Hepplewhite and Sheraton.

CHIP'PENHAM. A municipal and till 1885 parliamentary borough of England, Wiltshire, 13 miles N.E. of Bath, on the Avon, with one of the largest marts for cheese in the kingdom. It now gives name to one of the five parliamentary divisions of the county. Pop. (1931), 8493.

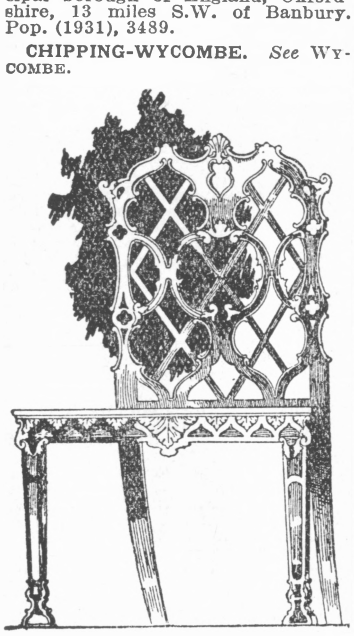
CHIPPEWAYANS (chip'pe-wā-anz). A race of Indians in the north-west territories of Canada.

CHIPPEWAYS (chip'e-wāz), or **OJIBBEWAYS.** A tribe of North

American Indians, United States, and Canada. They are distributed in bands round both sides of the basin of Lake Superior, where they once owned vast tracts. They are of the Algonquin stock, tall, active, and well formed, subsist chiefly by hunting and fishing, and number about 18,000.

CHIPPING-NORTON. A municipal borough of England, Oxfordshire, 13 miles S.W. of Banbury. Pop. (1931), 3489.

CHIPPING-WYCOMBE. *See* WYCOMBE.



Chippendale Chair

CHIQUIMULA (chi-ki-mö'lȧ). A department of the Central American state of Guatemala; area, 4000 sq. miles. Pop. about 94,180.

CHIQUITOS (chi-kē'tōs). An Indian people of Bolivia, about the headwaters of the Madeira and Paraguay. They number about 22,000, distributed into about forty tribes. They make straw hats and hammocks, and are hospitable and kindly people.

CHIRAGRA (ki-rag'ra). That species of gout which attacks the joints of the hand (the wrist and knuckles) and hinders their motions. It gradually bends, distorts, and finally stiffens the fingers.

CHIRETTA (ki-ret'ta), or **CHIRA'TA.** An Indian bitter derived from the dried stems of *Swertia Chirāta*, a Gentianaceous plant from the north of India. It is very similar in its properties to genitan, and is used medicinally for similar purposes.

CHIRIQUI (chi-ri-kē'). An administrative district in the state of Panama. It is naturally very fertile, and has good harbours both on the Caribbean and Pacific coasts. The name is also given to a volcano, a lagoon, and an archipelago on the coast. It has no connection whatever with "Cherokee," with which it is sometimes confused.

CHIRK. Village of Denbighshire. It is 10 miles from Wrexham, on the G.W. Railway. The little River Ceiriog and the Ellesmere Canal pass by it. Near by are collieries and slate quarries. Its castle, the seat of Lord Howard de Walden, was long the home of the Myddelton family. The first castle was built in the eleventh century, the present one in the fourteenth and restored in the seventeenth century. Pop. 2576.

CHIRON (kī'ron; son of Cronus and Philyra). The most famous of the Centaurs, a race fabled as half-men half-horses. He lived at the foot of Mount Pelion in Thessaly, and was celebrated through all Greece for his wisdom and acquirements, particularly for his skill in medicine and music, and the greatest heroes of the time—Dionysus, Jason, Hercules, Achilles, etc.—were represented as his pupils.

CHIRONECTES. *See* CHEIRONECTES.

CHIRU (chē'rö), *Pantholops Hodgsoni*. A fine large species of the antelope found in Tibet, somewhat larger than the chamois. The Tibetans ascribe special virtues to its blood, and use the rings on its horns for fortune-telling.

CHIS'LEHURST. An urban district of England, in Kent, where (at Camden Place) Napoleon III. lived after the Franco-Prussian War, dying in 1873. It now gives name to one of the eleven parliamentary divisions of the county. Pop. (1931), 9876.

CHISLEV (kis'lev; Heb. *Kislev*). The ninth month of the Jewish ecclesiastical and the third of the civil year, commencing with the new moon in December or the latter part of November. The Feast of Lights (or Dedication) is celebrated on the twenty-fifth day of this month.

CHISWICK (chis'ik). London suburb and parish, England, county

of Middlesex, 5 miles W. of Hyde Park Corner, London. There are many fine villas and gardens in the neighbourhood. Chiswick is now joined with Brentford to form an urban district. Pop. (1931), 62,617.

CHITALDRUG (chit-*al*-drŏg′). A town of India, Mysore, with fortifications constructed by Hyder Ali, formerly a station for British troops. Pop. 8520.

CHITIN (ki′tin). A sort of transparent horny substance, the chief tissue-forming ingredient of the wing-cases of insects, and the shells of crabs and other crustaceans. It is very resistant to chemical agents, but may be dissolved in strong mineral acids.

CHITONS (ki′tonz), or **CHITONIDÆ**. A family of primitive gastropods, affording the only instance known of a molluscan shell formed of many successive portions, often in contact and overlapping each other, but never truly articulated. The shell in the typical genus Chilton is composed of eight pieces, the animal adhering to rocks or stones after the fashion of the limpet. The species are numerous, and there are few rocky shores without some of them.

CHITRÁL (chit-räl′). A small native state in the extreme north of India, intersected by the Chitrál River, a tributary of the Kabul. In 1895 the British had to send a small expedition to Chitrál, which may now be regarded as part of British India.

CHITTAGONG (chit′-). A district of India, in Eastern Bengal, having the Bay of Bengal on the west; area, 2563 sq. miles; pop. 1,611,422. The level lands, chiefly on the coast and in the valleys, are very fertile. Many of the inhabitants are Mohammedans. Chittagong is also the name of a commissionership or division. Area, 11,772 sq. miles; pop. 6,000,524.—The city of **Chittagong**, chief town of the district and the chief port of Eastern Bengal, is situated on the Karnaphuli about 12 miles from its mouth. Though very unhealthy, its trade has of late been steadily increasing, the chief export being tea. Pop. 36,031.

CHITTAGONG WOOD. The wood of several Indian trees, especially of *Chickrassia tabulāris*, ord. Cedrelaceæ, a light-coloured beautifully grained wood used by cabinet-makers. In some parts of India it is called *cedar* or *bastard cedar*.

CHITTOOR′, or **CHITTORE.** A town of India, capital of the North Arcot District, Madras Presidency. Pop. 17,941.

CHITTY, Joseph. An eminent lawyer, born 1776, died 1841, has a high reputation as the author of legal textbooks dealing with commercial law, criminal law, international law, and medical jurisprudence.

CHITTY, Sir Joseph William. Grandson of the preceding, a famous judge, born 1828, died 1899. Sir Joseph was a distinguished graduate of Oxford, became a barrister in 1856, and soon acquired a large and lucrative chancery practice. He was made a justice in the chancery division of the High Court, and knighted in 1881, and made a Lord Justice of Appeal in 1897.

CHIUSA (ki-′ösȧ). Two Indian towns, one in N. Italy, province of Cuneo, pop. 5240; the other in Sicily, province of Palermo, pop. 6500.

CHIUSI (ki-ö′sē). The *Clusium* of the Romans, one of the twelve cities of the Etruscan Confederation; a town of Italy, province of Sienna, and 43 miles S. of Arezzo. It was the capital of Lars Porsenna, and has rich collections of Etruscan and Roman antiquities. Pop. 6730.

CHIVALRY (chiv′al-ri; Fr. *che-valerie*, from *cheval*, a horse), a term which indicates strictly the organization of knighthood as it existed in the Middle Ages, and in a general sense the spirit and aims which distinguished the knights of those times. It is an institution which took organic shape in the twelfth century, reached its maturity in the fourteenth, and lingered in a state of decay until the end of the sixteenth century. As a system it was, above all, feudal and tenurial. The chief characteristics of the chivalric ages were a warlike spirit, a lofty devotion to women, a love of adventure, and an indefinable thirst for glory.

Crusaders.—The Crusades gave for a time a religious turn to the spirit of chivalry, and various religious orders of knighthood arose, such as the Knights of St. John, the Templars, the Teutonic Knights, and others. The education of a knight in the days of chivalry was as follows: In his twelfth year he was sent to the court of some baron or noble knight, where he spent his time chiefly in attending on the ladies, and acquiring skill in the use of arms and in riding. When advancing age and experience in the use of arms had qualified the page for war, he became an *esquire*, or *squire*. This word is from Lat. *scutum*, a shield, it being among other offices the squire's business to carry the shield of the knight whom he served.

Knights.—The third and highest rank of chivalry was that of knighthood, which was not conferred before

the twenty-first year, except in the case of distinguished birth or great achievements. The individual prepared himself by confessing and fasting; religious rites were performed; and then, after promising to be faithful, to protect ladies and orphans, never to lie nor utter slander, and to live in harmony with his equals, he received the *accolade*, a slight blow on the neck with the flat of the sword from the person who dubbed him a knight. This was often done on the eve of battle, to stimulate the new knight to deeds of valour; or after the combat, to reward signal bravery.

Though chivalry had its defects, chief amongst which, perhaps, we may note a tendency to certain affectations, and exaggerations of sentiment and profession, yet it is to be regarded as tempering in a very beneficial manner the natural rudeness of feudal society. As a system of education for the nobles it taught them the best ideals, social and moral, which the times could understand, and filled a place in civilization which as yet the arts and letters could hardly occupy.

The primitive cult of physical bravery and vigour, one of the characteristics of chivalry, has long faded into a convention, but its abiding merit, the power to transmit into the standard of "the honour of a gentleman" a tradition of personal ethic, has made *noblesse oblige* a living maxim of the common day. *See also* FEUDALISM.—BIBLIOGRAPHY: Sir Walter Scott, *Essay on Chivalry*; Jean de Meung, *L'Art de Chevalerie*; Stebbing, *History of Chivalry and the Crusades*; F. W. Cornish, *Chivalry*; W. H. Schofield, *Chivalry in English Literature*.

CHIVASSO (kē-vȧs'sō). A town of Italy, 14 miles N.E. of Turin. Pop. 11,000.

CHIVE, or **CIVE** (chīv, sīv). A small perennial garden plant (*Allium Schœnoprasum*) of the same genus as the leek and onion, and used for flavouring soups. It is seldom found wild in Britain, where it is often cultivated as an edging for garden plots.

CHLADNI (*hlȧd'nē*), **Ernst Florent Friedrich.** German physicist, born 1756, died 1827. He investigated the laws of sound and made important experiments on the vibration of metallic and glass plates of various forms. His works include: *Discoveries Concerning the Theory of Sound* (1787); *Acoustics* (1802); *Contributions to Practical Acoustics, with Remarks on the Making of Instruments* (1822).

CHLADNI'S FIGURES. The figures formed by sand strewn on a horizontal glass or metal plate, or even a slip of wood, when it is clamped firmly at one point, and set in vibration by means of a violin-bow.

CHLAMYDOMONAS. A primitive genus of motile, unicellular Green Algæ, differing from Green Flagellates only in the possession of a permanent cellulose membrane and of sexual reproduction. The zoospores and gametes of many more advanced Green Algæ retain the form and organization of the ancestral Chlamydomonas cell.

CHLAMYDOPHORUS (kla-mido'-fo-rus). A genus of the South American armadillos (ord. Edentāta). The only species, *C. truncātus*, or pichiciago, resembles the mole in its habits; it is about 5 inches long, and its back is covered over with a coat of mail, consisting of twenty-four rows of tough leathery plates. Its internal skeleton in several respects resembles that of birds.

CHLAMYDOZOA. Described by various writers as a very minute intracellular organism, being the simplest type of living matter. It is neither bacteria nor protozoa. The organism is ultramicroscopic, and can pass through filters. Hartman states that it is the cause of vaccinia and variola, and probably of scarlet fever, measles, foot-and-mouth disease, and hydrophobia. The existence of the whole class is questionable.

CHLAMYS (klam'is). A light and freely flowing scarf or plaid worn by the ancient Greeks as an outer garment. It was oblong in shape, generally twice as long as its width.

CHLOASMA. A pigmentation of the skin of the face induced reflexly by some internal irritation. It sometimes occurs in connection with disease of the liver, uterus, or ovaries, or any abdominal trouble, but the majority of cases are associated with pregnancy. The spots are either round or oval, and vary from a yellowish-brown to a deep, almost black shade. They usually disappear at the end of pregnancy or with the cure of the disease.

CHLO'RAL, or **TRICHLORALDEHYDE** (CCl_3·CHO). A liquid first prepared by Liebig by passing dry chlorine gas through absolute alcohol to saturation, and still prepared in a similar manner. When mixed with water, it readily yields *hydrate of chloral*, $CCl_3CH(OH)_2$, a white crystalline substance which, in contact with alkalies, yields chloroform and formic acid. Chloral kills by paralysing the action of the heart, but is often employed in medicine. It is a hypnotic as well as an anæsthetic, and is frequently substituted for morphia. It has been successfully used in delirium tremens, St. Vitus's

dance, poisoning by strychnia, in tetanus, and in some cases of asthma and whooping-cough.

It should be taken with great caution and under medical advice, as an extra dose may produce serious symptoms, and even death. The treatment of poisoning by choral is to keep the person warm by means of blankets, warm bottles, etc. Warm stimulating drinks should also be administered, such as hot coffee, hot tea or negus. In certain experiments an animal kept warm by wrapping in cotton-wool recovered from a dose of chloral that otherwise would have killed it. Several derivatives of chloral are now used, e.g. chloralamide, also a hypnotic, and in some ways better than chloral itself.

CHLORANTHA'CEÆ. A nat. ord. of apetalous dicotyledons, allied to the peppers, and, like them, having an aromatic fragrant odour; natives of the warm regions of India and America. *Chloranthus officinālis* is reckoned a stimulant and tonic of the highest order.

CHLO'RATE. A salt of chloric acid. The chlorates are analogous to the nitrates. They are decomposed by a red heat, nearly all of them being converted into metallic chlorides, with evolution of pure oxygen. They deflagrate with inflammable substances with such facility that an explosion is produced by slight causes. The chlorates of sodium and potassium are used in medicine. The latter, in doses of from five to twenty grains, is largely used in scarlet fever, inflamed throat, etc. It is also used in the manufacture of lucifer-matches, fireworks, and percussion-caps, and as an oxidizer in dyeing and calico-printing, and in the manufacture of alizarin.

CHLORIDE OF LIME. *See* BLEACHING-POWDER.

CHLORIDES. *See* HYDROCHLORIC ACID.

CHLORIM'ETRY. The process of testing the bleaching power of compounds of chlorine, but especially of the commercial articles, chloride of lime or bleaching-powder, and potassium or sodium hypochlorite or bleach liquor.

CHLORINE (symbol, Cl; atomic weight, 35·45), a gaseous element, discovered by Scheele in 1774, who named it "dephlogisticated marine acid." In 1810 Sir Humphry Davy proved it to be a simple substance, and gave it its present name chlorine, from Gr. *chloros*, greenish-yellow. The element does not occur free in nature, but combined with metals it is widely distributed as chlorides. United with sodium it forms sodium chloride (NaCl) or common salt, and from this it may be liberated by sulphuric acid and manganese dioxide, or some other oxidizing agent. Potassium chloride is known as sylvite, and is found in the salt-mines of Stassfurt, in Saxony.

Chlorine is produced in quantity during the electrolytic preparation of sodium and caustic soda from sodium chloride. It is a non-combustible, heavy gas, two and a half times heavier than air, has a sharp, suffocating odour, and attacks the mucous membranes strongly, and if inhaled for any length of time causes death. Chemically it is a very active substance, and unites with many elements at ordinary temperatures. Thus finely powdered antimony, arsenic, copper, lead, etc., catch fire in chlorine, forming the chloride of the metal. Chlorine is a powerful bleaching-agent and disinfectant, owing to its great affinity for hydrogen. If moist chlorine be brought in contact with colouring-matters such as litmus, indigo, or dyes such as turkey red, the colour is immediately discharged.

The substance is used largely for bleaching and disinfectant purposes, either as chlorine or combined as bleaching-powder or hypochlorites. It is also used in the preparation of organic substances such as carbon tetrachloride and chloroform. Almost all the chlorine of commerce is prepared electrolytically, and sent on the market, in iron cylinders, either compressed or liquefied.

CHLORITE. A name for a group of minerals, such as pennine, clinochlore, etc., resembling green micas, but without elasticity in their cleavage-plates. Chlorites are magnesium iron aluminium silicates, combined with water rising to as much as 13 per cent. They are softer than mica, being easily scratched by the thumb-nail, and have usually arisen from the decay of aluminous amphiboles or pyroxenes, or from biotite mica, in igneous or metamorphic rocks. Chlorite-schist frequently contains crystals of magnetite.

CHLORITOID. A mineral resembling chlorite, but barely scratched by a knife, occurring in dull-grey platy forms in schistose rocks. Composition, hydrous aluminium iron silicate with some magnesium; silica about 25, aluminium 40, and ferrous oxide 25 per cent.

CHLO'RODYNE. A popular patent medicine used in allaying pain and inducing sleep, and containing morphia, chloroform, prussic acid, extract of Indian hemp, etc. There are several makes of it, but all have to be used with caution.

CHLO'ROFORM, $CHCl_3$. A volatile, colourless liquid with a sweet, nauseating taste and smell, prepared from bleaching powder and diluted alcohol. It was discovered in 1832, but only became well known after 1847, when it was introduced as an anæsthetic by Sir J. Y. Simpson. For this purpose its vapour is inhaled mixed with air—the degree of narcosis being in proportion to the dilution. At first a slight choking sensation is felt, followed by a feeling of warmth; then the senses become less acute; voices sound distant; a ringing in the ears, with a feeling of being unable to move, precede unconsciousness.

When the patient does lose consciousness, he may show considerable symptoms of excitement by struggling, groaning, or shouting; or, if the feeling is not so violent, it may be shown merely by twitching. In some cases these symptoms are entirely absent. From this he passes to a state of anæsthesia proper, where the muscles are relaxed, the face pale, the pupils contracted, and the reflexes lost. As consciousness begins to return, the patient passes through the same stages, but in a less marked and more gradual degree. Sickness usually occurs within the next twenty-four hours, and almost certainly if food or liquid be given.

In suitable cases, and given with care, chloroform is a useful anæsthetic, and is still widely used, though in the last twenty years ether has gradually superseded it in England. Deaths during chloroform administration are due either to its being used in too concentrated a form, leading to heart failure, or its action proving too much for a very debilitated patient during operation.

CHLO'ROPHANE. A variety of the mineral fluorspar, which exhibits a bright green phosphorescent light when heated.

CHLOROPHYCEÆ. *See* GREEN ALGÆ.

CHLO'ROPHYLL. The principal pigment of green chromatophores or *chloroplasts*. Extracted from leaves by alcohol, it forms a deep-green solution, with blood-red fluorescence and several strong absorption bands in the red and orange part of the spectrum. Its function in the chloroplast is to absorb these rays from sunlight, and to transform their radiant energy into chemical energy used in the process of carbon assimilation.

Chemically, it is a complex substance, allied to the red blood-pigment hæmoglobin, and consists of carbon, hydrogen, oxygen, nitrogen, phosphorus, and magnesium. Although it does not contain iron, a trace of this element is necessary for its formation; plants grown in complete absence of iron are accordingly yellowish (*chlorotic*), and do not thrive. Chlorophyll is always accompanied by other pigments, of which the yellow *carotin* is the most prevalent. In Phæophyceæ and Rhodophyceæ brown and red pigments are also present, and mask the chlorophyll. *See* CARBON ASSIMILATION; CHROMATOPHORE; RED ALGÆ.

CHLOROPLAST. In green plants, a specialized particle of protoplasm containing the green pigment (chlorophyll) which enables the energy of sunlight to be used in building up organic substances from water and carbon dioxide. The chloroplasts of flowering plants, ferns, mosses, liverworts, and some Algæ are minute round or ellipsoidal granules. But in lower Algæ they assume various shapes, and may be of comparatively large size. Spirogyra is a thread-like Alga consisting of a row of cylindrical cells, in each of which is a spiral chloroplast with jagged edges.

CHLOROSIS, or **GREEN SICKNESS.** An anæmia of unknown cause occurring in young girls and characterized by a marked loss of colour in the red blood corpuscles. Men are never affected. It is usually seen in underfed, overworked town girls between the ages of fourteen and seventeen, and is due to lack of fresh air and exercise, with improper feeding. The chief symptoms are the yellowish-green colour of the skin, gastro-intestinal and nervous disturbances, palpitation, general pallor, and often swelling of the feet. It is apt to be confused with the early stages of phthisis or heart disease, but examination of the blood is sufficient to distinguish it from either. **Treatment.**—The essential part of any treatment is the administration of iron, along with laxative medicines, and these, if taken for a suitable period, effect a complete cure. Relapses may occur in later life.

CHOATE, Joseph H. American lawyer and statesman, born in Salem, Massachusetts, 24th Jan., 1832, died 14th May, 1917. He graduated at the Harvard Law School in 1854, and afterwards went to New York. There he achieved remarkable success as a lawyer, having become a partner of the famous firm of Evarts, Choate, & Beaman. He conducted many celebrated cases in state courts and international tribunals, representing the Canadian Government in the Behring Sea dispute. From 1899 to 1905 he was Ambassador in London, and, as he says in his *Reminiscences*, those six years were among the happiest and most successful of his life. On

10th April, 1905, he was elected a Master of the Bench of the Middle Temple, an honour which gave him considerable gratification. He was famous as an orator and a humorous after-dinner speaker.

CHOCHO (chō'chō), *Sechium edūle*. A West Indian plant of the gourd family, with large fleshy tubers, edible, but not very palatable, and a gourd-like edible fruit.

CHOCKS. Pieces of wood employed on shipboard as wedges to support various articles liable to be displaced by the motion of the vessel.

CHO'COLATE (from Mex. *chocolatl*). A paste composed of the kernels of the *Theobrōma Cacāo* or cacao tree, ground and combined with sugar and vanilla, cinnamon, or other flavouring substance; also a beverage made by dissolving chocolate in boiling water or milk. It was used in Mexico long before the arrival of the Spaniards, and was brought to Europe by the Spaniards in 1519. It is now largely used in S. America, Spain, Italy, and Germany, but in Britain cocoa, which is a preparation from the same fruit, is much more common. Chocolate was introduced into England about 1657. *See* CACAO.

CHOC'TAWS. A North American Indian tribe, an important division of the Muskhogean family, now settled on a portion (10,450 sq. miles) of the Indian Territory on the Red River. They are ethnically allied to the Chickasaws and Humas. They formerly inhabited what is now the western part of Alabama and southern part of Mississippi. They cultivate the soil, are partially civilized, having a regular constitution prefaced with a bill of rights, courts of justice, books and newspapers. Their numbers are estimated at 18,000.

CHOIR (quīr). That part of a cruciform church extending eastward from the nave to the altar, frequently enclosed by a screen, and set apart for the performance of the ordinary service, as in the cathedrals at Canterbury, Augsburg, Chartres, Amiens, and Nôtre-Dame in Paris. The name is also given to the organized body of singers in church services.

CHOISEUL (shwä-seul). An ancient French family which has had many distinguished members. One of the best known is Étienne François, Duc de Choiseul-Amboise, born 1719, died 1785. He entered the army in early life, and after distinguishing himself on various occasions in the Austrian War of Succession, returned to Paris, where his intimacy with Madame de Pompadour furnished the means of gratifying his ambition.

After having been Ambassador at Rome, and at Vienna, where he concluded with Maria Theresa the treaty of alliance against Prussia, he became in reality Prime Minister of France, and was very popular through a series of able diplomatic measures. He negotiated the famous Family Compact which reunited the various members of the Bourbon family, and restored Corsica to France in 1768. His fall was brought about in 1770 by a court intrigue, supported by Madame du Barry, the new favourite of the king. He was banished to his estates, but his advice in political matters was frequently taken by Louis XVI. — BIBLIOGRAPHY: F. Calmettes, *Mémoires du Duc de Choiseul*; G. Mangros, *Le Duc et la Duchesse de Choiseul*; R. H. Soltau, *The Duke de Choiseul.*

CHOISY-LE-ROI (shwä-sē-l-rwä). A handsome town, France, 7 miles S. of Paris, on the Seine. In its cemetery is the tomb of Rouget de l'Isle, author of *The Marseillaise.* Pop. 23,635.

CHOKE-DAMP, or AFTER-DAMP. The name given to the irrespirable gas (carbonic acid) found in coal-mines after an explosion of fire-damp or light carburetted hydrogen.

CHOKING. Choking from swallowing of food may usually be relieved by vigorous thumping between the shoulder blades. If this fails gag the mouth open with a piece of wood and pass the fingers down the back of the throat to hook up the foreign body or to push it onward towards the stomach.

In the case of a child, hold it upside down and shake it if slapping on the back is not efficacious. If a large or sharp object has been swallowed, give the patient bread and milk or porridge, and summon a doctor.

If hot liquids or stinging insects have been swallowed, causing swelling in the throat, apply hot flannels to the front of the neck and take sips of cold water and of olive oil.

CHOKING COIL. A piece of electrical apparatus designed for use on alternating-current systems. It consists of a coil of wire wound on a closed ring of soft iron, so that the iron ring threads each turn of the coil of wire. A coil wound in this way is a highly conductive one, and, if it is connected in circuit with an alternating-current dynamo, it offers a powerful impedance to the flow of current, but very little resistance. The back-electromotive force induced in the coil by the alternating magnetic field in the iron core is, vectorially, at right angles to the current nearly, and consequently very

little energy is consumed. The instrument, therefore, is more economical as a means of damning back the flow of an alternating current than an ordinary resistance would be. —BIBLIOGRAPHY: M. Maclean, *Electricity and its Practical Applications*; C. G. Lamb, *Alternating Currents*.

CHOLAGOGUE (kō'la-gōg). A medicine which has the property of stimulating the flow of bile.

CHOLERA. A disease sometimes called **Asiatic Cholera** on account of its presence from early times in India and the East. It is only within the last century that the disease has been found in Europe and America. In 1832 both Britain and North America suffered from a severe epidemic, and in 1854 and 1866-67 the disease again broke out, though not to such a severe degree. Except for a few odd cases brought in by ships it has never gained a foothold in Britain since 1873, though the south of Europe and Russia have suffered in the present century. During the European War (1914-18) cholera broke out in Germany and Austria, and also during the campaigns in Mesopotamia and Gallipoli.

Cholera is caused by a comma-shaped bacillus discovered by Koch in 1884. The disease is not highly contagious, but those in contact with the clothing of the patient are very liable to be infected. Infection itself is usually conveyed by water, milk, or vegetables washed in infected water. The virulence of an epidemic is in direct proportion to the contamination of the water-supply. Cholera "carriers" undoubtedly help to spread the disease, especially if they are persons who have to do with the preparation of food. The infection is not borne by atmosphere. High temperatures favour its spread, hence in Britain the epidemics have invariably taken place in late summer or autumn. It is doubtful whether one attack furnishes immunity against a second.

Symptoms.—There are three stages in the course of an attack. 1. *Preliminary*: Diarrhœa (associated with colicky pains and cramps), headache, depression, and perhaps vomiting are present. 2. *Collapse*: In this stage there are marked increase of diarrhœa, griping pains, intense thirst, extreme exhaustion, and the patient rapidly passes into a state of severe collapse. The course of the disease at this point is so rapid and severe that within a few hours the patient's face becomes pinched and the features shrunken. The temperature, which on the surface is from 5° to 10° below normal, is internally 103° to 104°. In the majority of cases the patient soon becomes comatose and dies. 3. *Reaction*: If the patient survives, reaction takes place quickly, vitality returns, and the warmth of the body is re-established. The recovery may be interrupted by recurrency of the disease. The chief complications that may arise are pneumonia, pleurisy, nephritis. Many patients suffer, after recovery, from cramps in the limbs. The more rapid the onset of symptoms, the more deadly the result. Intemperance, debility, exposure, and old age considerably lessen the chances of recovery. The mortality is very high, 50 to 80 per cent. in epidemics.

Cholera sicca is the name given to the very severe type, where death takes place within a few hours after onset. No preliminary diarrhœa is present in this type. *Cholera infantium* is a term applied to a very severe form of gastro-enteritis in infants. It is characterized by many symptoms similar to those of cholera, and there is marked prostration with a high death-rate.

Treatment.—Serum is used with considerable success as a preventive measure during epidemics, or as a precaution in districts where cholera is endemic. Troops sent to such districts are inoculated with serum. It is of the utmost importance that the sanitary conditions are well looked after. At the onset of the disease purgatives are of value, but these should not be given in the later stages. Intestinal antiseptics are much used, but are of little benefit. Warmth, rest, and stimulation by ether or strychnine must be given during collapse, while intravenous injection of saline solution is found to be of value. Hot applications to the abdomen and morphia injections may be given to relieve the pain.

CHOLERINE. A term used to denote a mild form of cholera. During cholera epidemics these milder cases occur, and are characterized by diarrhœa, with griping pains, copious stools, vomiting, and cramps, with a slight degree of collapse. The treatment of these cases is essentially the same as the treatment of cholera (q.v.)

CHOLESTERIN, or CHOLESTEROL ($C_{27}H_{45}OH$). A monatomic alcohol of complex structure belonging to the aromatic series. It is a constant constituent of protoplasm, and is found in every living cell throughout the body tissues, prominently in nerve-sheaths. It is present in excess in the bile, and leads to the formation of gall-stones. Combined with fatty acids, it helps to form wool, feathers,

and the natural oils of hair. It is a substance of marked stability. *See* BILE.

CHOLET (sho-lā). A town of N.W. France, department of Maine-et-Loire, 32 miles S.W. of Angers, with manufactures of cotton goods and woollen stuffs, and a brisk trade. Pop. 21,058.

CHOLOS (chō'lōs). In Peru, the name for those who are partly of white, partly of Indian parentage.

CHOLULA (chō-lō'lá). A town of Mexico, 60 miles S.E. by E. of Mexico, formerly a large city, the seat of the religion of the ancient Mexicans, with more than 400 temples. One of these temples still remains, built in the form of a pyramid, each side of its base measuring 1440 feet; height, 164 feet. Pop. 9800.

CHOMŮTOV. A town of Bohemia, Czechoslovakia. Pop. 21,123.

CHONDRITE (kon'-). A fossil seaweed.

CHONDROI. Peculiar globular mineral aggregates characteristic of the partly stony meteorites. They are frequently to be seen in sections for the microscope or on polished surfaces.

CHONDROPTERYGII (kon-dropte-rij'i-i). One of the two great sections into which Cuvier divides the class Pisces or fishes, distinguished from the fishes with true bone by the cartilaginous or gristly substance of which the bones are composed, and by the cartilaginous spines of the fins. The families include the sturgeon, shark, ray, and lamprey.

CHONOS ARCHIPELAGO (chō' nōs). A group of islands lying off the west coast of Patagonia, mostly between lats. 44° and 46° S., and long. 74° and 75° W. Two are large, but they are all barren and scantily inhabited.

CHONS (könz), or **KHONSU** (kön'sū). An Egyptian deity worshipped at Thebes. Rameses III. built a special temple for this god at Karnak.

CHOP'IN. A Scottish liquid measure containing two imperial pints or one quart.

CHOPIN (sho-paṇ), **Frédéric François.** Pianist and musical composer, of French extraction, was born at the village of Zelazowa Wola, near Warsaw, in 1810; went to Paris in 1831 on account of the political troubles of Poland. He became intimate with George Sand, to whom Liszt had introduced him, but broke with her in 1846 after the publication of her novel *Lucretia Floriani*. He went to Scotland in 1848, at the invitation of his admirer Jane Sterling, but soon returned to Paris, where he died in 1849. He wrote numerous pieces for the pianoforte, chiefly in the form of nocturnes, polonaises, waltzes, and mazurkas, all of which

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display much poetic fancy, abounding in subtle ideas with graceful harmonic effects.—BIBLIOGRAPHY: F. Niecks, *Chopin as Man and Musician*; F. Liszt, *Life of Chopin*; E. S. Kelley, *Chopin the Composer*.

CHOPINE (chop-ēn'). A very high shoe or elevated clog, introduced into England from Venice in the reign of Queen Elizabeth, and which became the fashionable wear of court ladies during that reign. They were made of wood covered with leather of sundry colours, white, red, yellow, and sometimes gilt. Some of them were of great height, as much as 18 inches, the height of the chopine being seemingly regarded as a mark of the rank of the wearer.—Cf. *Hamlet*, ii. 2, 446.

CHOP-STICKS. The Chinese substitute for our knife, fork, and spoon at meals, consisting of two smooth sticks of bamboo, wood, or ivory, which are used with wonderful dexterity for conveying meat to the mouth.

CHORAGUS (ko-rō'-). A name given by the Greeks to the leader or director of the choruses furnished for the public festivals, and who also defrayed the expenses of the chorus.

(*See* CHORUS.) The choragus who was adjudged to have performed his duty best received a tripod of brass, for which he had to build a monument, on which it was placed. A street in Athens which contained a great number of these choragic monuments was called the Street of the Tripods.

CHORALE (ko-rä'le), or **CHO'RAL.** The psalm or hymn tune of the German Protestant churches, a simple melody to be sung in harmony or in unison by a number of voices to sacred words.

CHORAL MUSIC (kō'ral). Vocal music in parts; music written or arranged for a choir or chorus, and including oratorios, cantatas, masses, and anthems.

CHORAL SERVICE. In the Church of England, service with intoned responses, and the use of music throughout wherever it is authorized. The service is said to be *partly* choral when only canticles, hymns, etc., are sung; *wholly* choral when, in addition to these, the versicles, responses, etc., are sung.

CHORD (kord; Gr. *chordē*, a string of gut). In music, the simultaneous combination of different sounds, consonant or dissonant. The common *chord* consists of a fundamental or bass note with its third and fifth. When the interval between the bass note and its third is two full tones, the combination is a *major chord*; when the interval is a tone and a half, the combination is termed a *minor chord*; when the intervals between the bass note and its third and the third and the fifth are each a tone and a half, the chord is called *diminished.* The *tonic chord* is made up of the key-note and its third and fifth; the *dominant chord* consists of the dominant or fifth of the scale, accompanied by its third and fifth; the *subdominant chord* has for its root or bass the subdominant or fourth of the scale, accompanied by its third and fifth.—In geometry, a chord is a straight line drawn, or supposed to extend, from one end of an arc of a circle to the other.

CHORDA. A genus of Brown Algæ, family Ectocarpaceæ. *C. filum* is common in sandy bays on our coasts, where its long tough fronds, which resemble a leather bootlace in form and texture, may become a danger to swimmers.

CHORDA DORSA'LIS. The notochord or dorsal chord. *See* NOTOCHORD.

CHORDÆ VOCA'LES. The vocal chords or cords. *See* LARYNX.

CHOREA. Nervous disease usually occurring before puberty, oftener with girls than boys. It may arise in association with hereditary predisposition, fright, ill-usage, malnutrition, or educational strain. It is believed to be a cerebral or brain form of rheumatism. The symptoms may develop insidiously. They take the form of convulsive muscular movements in face or limbs, which may be local or general. It is also called St. Vitus' dance.

CHORIAMBUS (ko'-). In prosody, a foot consisting of four syllables, of which the first and last are long, and the others short; that is, a choreus, or trochee, and an iambus united.

CHORION (ko'ri-on). In anatomy, the external membrane, covered with numerous villi or shaggy tufts, which invests the fœtus in utero.

CHORLEY (chor'li). A municipal borough and market town, England, Lancashire, on the Chor, 20 miles N.W. of Manchester, with manufactures of cotton goods, calico-printing and dye-wood works, floor-cloth works, and iron-foundries. In the vicinity are coal, lead, and iron mines. Chorley gives name to one of the 18 parliamentary divisions of the county. Pop. (1931), 30,795.

CHOROID (kō'-). A term applied in anatomy to various textures; as the *choroid membrane*, one of the membranes of the eye, composed mainly of a mass of blood-vessels, situated between the sclerotic and the retina, and terminating anteriorly at the circumference of the iris.

CHORUS (kō'rus). Originally an ancient Greek term for a troop of singers and dancers, intended to heighten the pomp and solemnity of festivals. In the choric songs sung in honour of Dionysus the ancient Greek drama had its birth. During the most flourishing period of ancient tragedy (500-400 B.C.) the Greek chorus was a troop of men or women who, during the whole representation, were spectators of the action, never quitting the stage. In the intervals of the action the chorus chanted songs which related to the subject of the performance. Sometimes it even took part in the performance, by observations on the conduct of the personages, by advice, consolation, exhortation, or dissuasion. In the beginning it consisted of a great number of persons, sometimes as many as fifty; but the number was afterwards limited to fifteen.

The provision of a chorus was in Athens an honourable civil charge, and was called *choragy.* (*See* CHORAGUS.) Sometimes the chorus was divided into two parts, who sang alternately. The divisions of the

chorus were not stationary, but moved from one side of the stage to the other; from which circumstance the names of the portions of verse which they recited, *strophe*, *antistrophe*, and *epode*, are derived. As a factor in drama the chorus has survived in various imitations or revivals of the ancient Greek theatre, such as *Samson Agonistes*.—In music, the chorus is that part of a composite vocal performance which is executed by the whole body of the singers, in contradistinction to the solo airs and concerted pieces for selected voices.

The singers who join in the chorus are also called the chorus. The term is also applied to the verses of a song in which the company joins the singer, or the union of a company with a singer in repeating certain couplets or verses at certain periods in a song. *See* DRAMA.—Cf. H. Coward, *Choral Technique and Interpretation*.

CHOSE (shōz; Fr., a thing). In law, property; a right to possession; or that which may be demanded and recovered by suit or action at law. Thus, money due on a bond or recompense for damage done is a *chose in action*; the former proceeding from an *express*, the latter from an *implied* contract. A *chose local* is annexed to a place, as a mill or the like; a *chose transitory* is a thing which is movable.

CHOSROES (kos'ro-es) I., or **KHOSRU.** Surnamed *the Just*, the greatest of the Sassanid kings of Persia, reigned A.D. 531-579. At his accession Persia was involved in a war with the Emperor Justinian, which Chosroes terminated successfully, obliging Justinian to purchase peace by the payment of a large sum of money. In 540, however, jealous of the victories of Belisarius, the great general of the empire, Constantine violated the peace, invaded Syria, laid Antioch in ashes, and returned home laden with spoils. The war continued till 562, when the emperor again purchased peace by an annual tribute of 30,000 pieces of gold. The peace continued for ten years, when the war was renewed with Justin, the successor of Justinian, when Chosroes was again successful. The succeeding emperor, Tiberius, at length completely defeated the Persians in 578.

CHOTÁ NÁGPUR, or CHUTIA NAGPORE. A division of British India, Presidency of Bengal, divided into the districts of Lochardaga, Hazaribagh, Singbhum, and Manbhum; and nine feudatory states. Total area, 27,065 sq. miles. Pop. 6,639,041.

CHOUANS (shō-ăn). A name given the Royalist peasantry of Brittany and Lower Maine, who carried on a petty warfare against the Republican Government from an early period of the French Revolution. The name, finally extended to all the Vendeans, was derived from the first chief of the Chouans, Jean Cottereau, who with his three brothers organized these bands in 1792. Cottereau had joined a band of dealers in contraband salt, and acquired the surname *Chouan* from the cry of the screech-owl (Fr. *chat-huant*) which he used as a signal with his companions. He was killed in an engagement with the Republican troops in 1794. The Chouans were not suppressed till 1799, and even after that occasional spurts of insurrection occurred down till 1830, when they were finally put down.—BIBLIOGRAPHY: Beauchamps, *Histoire des Chouans*; E. Daudet, *La Police et les Chouans dans le Consulat et l'Empire*, 1800-1815.

CHOUGH (chuf), **CORNISH CHOUGH, or RED-LEGGED CROW.** A bird belonging to the genus Fregilus, of the crow family, but nearly allied to the starlings. *Fregĕlus* or *Pyrrhocorax graculus* is the only British or European species, and frequents, in England, chiefly the coasts of Cornwall. Its general colour is black, contrasting well with the vermilion-red of the beak, legs, and toes. Other species are native to the Alps and Himalayas.

CHOW CHOW. A domestic dog. A native of China, it is very popular in England. It has a heavy coat with a ruff round the neck and may be black or white, blue or red in colour.

CHRÉTIEN (or CRESTIEN) DE TROYES (krā'ti-en). A French trouvère, born at Troyes about 1150, died about the end of the twelfth or beginning of the thirteenth century. His fame rests upon six romances still extant, viz. *Erec et Énide*; *Perceval le Gallois*; *Le Chevalier au Lion*; *Cligés*, *Chevalier de la Table ronde*; *Lancelot du Lac*, or *de la Charette*; and *Guillaume d'Angleterre*. Two others of his works, *Tristan, ou le Roi Marc et la Reine Yseult*, and *Le Chevalier à l'Épée*, have been apparently lost.

CHRISM (Gr. *chrisma*, salve). The holy oil prepared by the Roman Catholic bishops, and used in baptism, confirmation, ordination of priests, and the extreme unction. The name is derived from the Greek word *chriein*, "to anoint."

CHRISOM (kris'om). A white garment formerly laid upon a child at baptism in token of innocence.

primitive Christianity pushed, finding materials for its growth and organization here as well as in the cosmopolitanism popularized by the Stoics, the institutional ideas of the Roman Empire, and the transcendentalism of the Platonic philosophy which was then beginning to revive. All these movements were subversive of the popular polytheistic religion of the empire, which, although still strong among the masses, was more and more inadequate to meet the fresh religious cravings of the world.

The extent of this Roman world was from the Sahara in the south to Britain in the north, from Spain on the west to the Balkans and Parthia in the east. The political unity imposed by Rome upon the various provinces rendered it more easy than before for any new religious movement to spread along lines marked out by trade and the army. Life was fairly safe; there were facilities for travel; and, except upon the northern and eastern frontiers, where wars occasionally broke out, peace reigned, and with peace a certain prosperity such as the troubled days of the later republic had never known. The policy of Rome was to leave her subjects undisturbed as far as possible in their religious beliefs and practices. And this proved particularly serviceable in dealing with one of her most recent and refractory provinces, Palestine.

The Jews were adroitly managed through their rulers, the Herods, supervised by Roman governors who interfered as little as possible with the Jews, and contented themselves with preserving order. Taxes are rarely popular, and never popular when they have to be paid to a foreign conqueror. The Jews had to pay a tax to the Roman Cæsar, but otherwise they were left unmolested to govern themselves, enjoying freedom of worship and all the privileges which Romans permitted to any national religion of a moral character within their domain.

It was in this province of Judæa, and under these conditions, that Christianity arose. The Roman historian Tacitus curtly sums up the historical facts as follows: "The originator of this name [Christians], Christ, was put to death in the reign of Tiberius by the procurator Pontius Pilate, and the pestilential superstition was checked for a while; but it broke out again, not only in Judæa, where the mischief first began, but also at Rome, where all sorts of horrible and shameful practices pour in and become popular." The new religion began in a revival movement within Judaism, headed by a prophet, John, who had his converts immersed in the Jordan, and was therefore called "the baptist, or baptizer." His appeal to the nation was an appeal for repentance and purification of life, in view of the imminent advent of the divine Kingdom, i.e. the coming of God in power to set up the theocracy on earth as the ancient prophets had foretold.

The movement spread. John was presently arrested and put to death by the Jewish kinglet Herod (not by the Romans), either because he offended Herod by his unflinching preaching or because he was suspected of starting a popular insurrection. But a young devout Galilean called Jesus, whom he had baptized, began a fresh movement in Galilee as well as in Judæa, announcing the immediate advent of the kingdom also, but interpreting it with a wealth of moral and spiritual ideas which struck far more directly than did John at the conventional religion of the authorities. He gathered round him a band of devoted adherents, especially an inner circle of twelve who acted as his delegates and were trained by him to preach the good news and to exorcise evil spirits. The authorities were alarmed by the trenchant criticism passed by Jesus upon the orthodox Judaism of the day. Their interference led to a withdrawal of Jesus from the scenes of his early popularity in Galilee. He then spoke openly but privately to the twelve of his vocation as God's Son, the long-promised Messiah who was to introduce the new kingdom by suffering upon the cross.

Finally he went to Jerusalem, accompanied by his followers, proclaimed himself as Messiah, was betrayed by one of his inner circle, and put to death by the Roman governor, at the instigation of the priests, upon a charge of sedition and blasphemy. This was on a Friday, about the year A.D. 30. The following Sunday his grave was found empty. His disciples declared that he had risen from the dead, as he predicted. Visions of him were vouchsafed to them, and on the strength of this intense faith his adherents rallied, first in Galilee and then in Jerusalem, to await his return from Heaven. They organized themselves eventually into a devout community within Judaism, which called itself the Church. Their watchword was "Jesus is the Christ (or Messiah)."

They claimed to be the true representatives of God's people, to whom His promises had been and were yet to be fulfilled. The revelation of God which had been made within Judaism was now realized in the life and

death and resurrection of Jesus, whose death as a sacrifice established a new and final bond of union between God and men. Such, in essence, was the conviction which breathed through the primitive community.

Hitherto the followers of Jesus had been tolerated within the Jewish community of Jerusalem, of which they professed themselves loyal members. All were Jews. Presently one of them, Stephen, spoke out with prophetic directness upon the crime committed by the Jews in murdering Jesus, and predicted, on the lines of Jesus, the approaching supersession of the Jewish cultus by God. For this Stephen was martyred. The implications of Christianity were forced upon the minds of the Church as well as upon the authorities. But it was a new convert, a brilliant young leader of the Pharisees, who first opened up the path for the new religion, by advocating the appeal of Christianity to non-Jews as well as to Jews. Paul was not the first to preach the gospel outside the limits of Judaism, but he was the first to expound and develop the movement from the headquarters of the Church at Antioch.

This led to a crisis within the Church at Jerusalem, where the apostles and first nucleus of the Christians tended to cling to the narrower conception of the mission of the new religion. Eventually an understanding was reached, by which the right of non-Jews to become Christians without being circumcised and without having to keep the Jewish law was recognized. A strict party in the Church protested, and caused trouble afterwards. But Paul and some other missionaries carried the gospel far and wide over the Mediterranean world, originally availing themselves of the synagogues in order to propagate their beliefs, and finally finding themselves forced to break with Judaism so as to reach the outside world. Their converts were largely drawn from the devout proselytes, who had hitherto furnished many recruits to Judaism itself.

By the time that Paul was arrested by the Jews in Jerusalem, and put to death at Rome by the Roman authorities (about A.D. 65), Christianity had been planted in the empire from Syria in the east to Rome, possibly to Egypt and Spain in the west; groups of Christians existed in Macedonia and Greece as well as in Asia Minor, and the rest of the primitive apostles had scattered over the world in various directions. The only ones of whom authentic tradition has preserved any trace are Peter and John, the work of the former being connected with Corinth and Rome, the latter being connected with Asia Minor, where Ephesus formed the next centre of the new religion. Jerusalem had fallen, in A.D. 70, during the Jewish revolt, and with Jerusalem the old centre of Christianity.

Henceforth the fortunes of the new faith were to lie along the lines marked out by the course of the early missions in the outside world which had Rome as its centre. The only mission in the East of any permanent significance was in Eastern Syria, at Edessa, but the disturbed condition of the country hampered it during the next few centuries, and the real centre of gravity is to be found in the West.

Here the history of Christianity during the next period, down to about the beginning of the fourth century, is determined by its relations to two powers, the Roman State and popular paganism. The leading figures are the martyr and the apologist; the one is persecuted by the State for refusing to conform to the imperial law, the other has to meet contemporary criticism of Christianity. Sometimes they were the same. The apologist becomes a martyr, as in the case of Justin Martyr, who not only wrote but suffered for his religion. But, fundamentally, the two lines of activity may be kept separate. As Tacitus remarks, about the beginning of the second century Christianity seemed to have broken out afresh; it was forcing itself upon the attention of the Romans in open daylight.

The Romans were not a persecuting people, but Christianity was persecuted because it was not an accredited or licensed religion, as every religion had to be. It was not a national religion. It seemed to the suspicious Romans a vast secret society, meeting for purposes of sedition, without any visible signs of religion such as altars, temples, or priests.

The Romans had a just fear of secret societies at this period, and they also suspected Christians of immorality in their secret gatherings. Besides—and this was the supreme charge—Christians would not call Cæsar "lord," and this worship of the emperor was, especially in the East, the recognized badge of patriotism. The book of Revelation is a burning tract for the times, written to encourage the Christians of Asia Minor against the demand for worshipping Domitian as divine. On this issue the early persecutions turned; what to the one was a reasonable proof of patriotism was to the other a mark of idolatry, in-

compatible with the Christian worship of God. No compromise was possible. The Roman authorities did check anonymous informers, and rarely struck at Christians except under local pressure. But Christians were generally liable to persecution on the charge of being an illicit sect, and while the policy varied in its severity of application, it persisted.

In the middle of the third century, after a long interval of peace, Decius the emperor enforced the law with special vigour, and half a century later Diocletian made persecution of Christians one of his political reforms, purging the army of Christians, and ordering the destruction of all churches and Bibles, just as Decius formerly had struck at the clergy in order to intimidate the faithful. But this was the last effort of the pagan State. Constantine, with political foresight, saw that the stability of the empire required the toleration of this Church.

As he rose to power, after defeating his rivals, he identified himself with the new religion, and, after proclaiming toleration for all religions by the Edict of Milan in 313, went on to adopt Christianity as the official religion of the empire. This meant the end of the long struggle. Christianity had proved itself too tenacious to be uprooted; it had permeated all ranks and classes of the empire, and claimed to be not a disruptive force but the one adequate power of dealing with the souls of men. Constantine relied upon the support of Christians, and not in vain. He aimed at organizing the empire afresh, and for his purpose this seemed the one religion available for so necessary a consummation.

The heroic fidelity of the martyrs had led to this wonderful reversal of the traditional Roman policy, but it had been allied to the work of the apologists during the second and third centuries. These thinkers had demonstrated the true character of their religion against pagan slanders and misconceptions, and had thus contributed to the change in popular opinion which made it possible for Constantine to carry out his project. The work of the apologists, indeed, had been still broader; it had covered the field of popular objections to Christianity, and had attacked the polytheism of the masses as well as the philosophical rivals of the new faith.

The apologists had cleared up the relation of Christianity to Judaism and also to current theosophy, developing a theology and philosophy of their own which could encounter criticism from without. And the apologists were simply one branch of the growing Church, which, in the welter of the age, confronted by movements like gnosticism, a blend of religion and philosophy, threw up three barriers behind which their own life throve: (*a*) the apostolic clergy, deriving their authority from the primitive apostles; (*b*) the apostles' creed; and (*c*) the canon of the New Testament, consisting of primitive writings which claimed apostolic authorship or inspiration. The officials, the tradition or articles of belief, and the code of the Church were thus linked to the origins of the movement, in order to check religious anarchy and innovations of a speculative kind, which were swarming inside as well as outside the Church in the second century.

It was the beginning of dogma, polity, and a discipline of life and worship, which proceeded to alter the eucharist into a sacrifice, analogous to those of pagan religions, and requiring a valid body of priests in the shape of the clergy to administer it. Under Cyprian the later transformation of the clergy into a hierarchy was promoted in North Africa. Alexandria and Asia Minor shared in the dogmatic development, while Rome's Church was becoming, owing to its hereditary connection with St. Peter and St. Paul, as well as to the prestige of the capital, increasingly prominent in the Western Church. But there were five patriarchs, at Constantinople, Jerusalem, Alexandria, Antioch, and Rome, each as yet equal to the others in authority.

One of the issues of the next period was which of the five was to be supreme. Meantime, the expansion of the Church in these five provinces, the development of ritual and dogma, and the part played by Christians in most spheres of public life, proved how the persecution period had served to consolidate the Church upon the whole, and render it conscious of its part and future in the world.

The adoption of Christianity as the official religion of the empire makes the fourth century an epoch in its history; a new period opens, with fresh problems and opportunities, which ends in the ninth century, when the Holy Roman Empire comes into being. The dominant factor during this age is the transference of the centre of gravity from the Mediterranean basin to Western Europe. This involves the separation of the Eastern and Western Churches, owing to political as well as to religious reasons. Furthermore, it means the rise of the Roman Church and bishop to a commanding place in Western Christianity. The alterations which occurred during these five centuries

may be measured by the fact that while in 325 the Emperor Constantine presided at the Church Council of Nicæa, Pope Leo III. crowned Charlemagne in 800 as king of the Roman Empire. With this coronation the mediæval period of Christianity in Europe commences. But what concerns us first of all is what led up to this step, not what followed from it.

During the interval between the fourth and the ninth centuries the Eastern and the Western Churches had begun to fall apart. This was in the main due to Constantine's policy of founding a new capital for the empire at Constantinople or Byzantium, but it was the last thing which he contemplated. So far from desiring any division within the Church, he worked for unity among Christians in order to promote unity in his empire. One State, one religion—was his ideal as a statesman. Hence his eagerness at Nicæa to persuade the Church to agree upon a creed.

The foundation of the new capital at Constantinople was due to two reasons, to considerations of strategy and administration, and also to the religious feeling that old Rome was too full of pagan associations to form a suitable centre for a Christian empire. But the change produced results of which neither he nor any one else at the moment ever dreamed. It brought into existence the Eastern Church as a form of the Byzantine Empire, and it left the way open for the Bishop of Rome, as the leading authority in the West, to advance to what became Papal authority in Church and State.

It was not the controversies and councils upon the person of Christ and the Trinity, which raged from the fourth century to the eighth, involving minor disputes like those upon the Mother of God and upon the veneration of images, that really separated the two Churches. The Eastern Church certainly venerated images more than the Western Church did, but the doctrinal issues were common to both, and the final victory of the Athanasian orthodoxy over the Arian creed was as much a triumph of the East as of the West, the chief contributions being generally made by theologians and ecclesiastics of the East.

That the Son was as divine as the Father was a conclusion which consolidated Christians over the whole empire. But the controversy started friction between the two Churches as it developed, and the Eastern Church, with its greater passion for subtle definitions of faith and speculative doctrine, suffered disastrously from internal dissensions, especially in Syria and Egypt. These weakened the authority of Byzantium, politically and religiously. The difference of temperament between the two Churches was accentuated by the emergence of a minor doctrinal issue in the course of the Trinitarian controversy. Western theologians began to assert that the Holy Spirit proceeded from the Son as well as from the Father, which the Eastern Church declined to admit.

This contention, in the form of the famous *filioque* clause, was destined to drive a wedge between the two Churches. But the division was rendered possible by local considerations as well. The Byzantine Church, under the sway of a resident emperor, had not the freedom of development which the Western Church enjoyed, and was able to use, thanks to its more practical genius. For although the emperor could and did interfere with the Roman bishop, the latter had no civil authority upon the spot to dominate the situation. Furthermore, the exigencies of the period developed different attitudes in the East and in the West, which produced different types of Christianity.

The rise of Islam in the seventh century affected both; North Africa as well as Syria and Egypt had to yield to the Mohammedan power, and the West as well as the East had to beat off the invaders. But the Byzantine Church bore the brunt of the attack as the West was not called upon to do. Constantinople rendered valuable services to Christendom by her sturdy opposition to the forces of Islam, holding them back for centuries, when they might have poured into Europe from the East. But the Eastern Church had been weakened by her long absorption in doctrinal controversy, and she was obliged to act upon the defensive against Islam for centuries; whereas the Western Church was more free to develop an offensive in the shape of propaganda among the Western invaders from the north, who had already swept down upon Italy.

The difference between the two Churches may be illustrated by their respective use of monasticism. This vital movement rose in the fourth century as a protest against the world in the Church no less than against the world itself. It was a lay movement, harking back to the old eschatology, defiantly ascetic, and withdrawing men and women to the wilderness from a civilization which seemed ripe for doom. Its original centres were Egypt and the East, especially Syria.

As time went on, it remained for the most part a recluse movement in the East. But in the West this holiness movement showed itself capable of growth. It ceased to maintain a purely negative attitude to the Church and the world, and, under a series of reforms and reorganizations, came back to serve the Western Church not only by advancing piety and learning but by promoting missions. In the evangelization of the north and west of Europe the moral leadership fell principally to the monks. The Roman instinct for organization, inherited by the Western Church, turned monasticism into a pioneering force, as Gaul and Germany opened up; the organized form of Christianity in these regions was the diocesan and episcopal, but alongside of this the monastic organization supplied men of ardour and initiative, who carried the gospel among these northern tribes.

The descent of these nations upon Italy in what Dr. Hodgkin calls the "prolonged moral earthquake" of the fifth century seemed to the agonized Romans the end of all things. In reality, it was the beginning of a new age. The Goths swarmed into the East also, under Alaric, but their chosen prey was the West. Invasion followed invasion. In 476 the line of Roman emperors in the West ended, after which dynasties of Franks and Lombards ruled Italy till Charlemagne rose upon both to inaugurate afresh the Roman Empire in the West, side by side with the Italian Pope, whose co-operation with Charlemagne entitled the new power to be called the Holy Roman Empire.

When Leo formally crowned Charlemagne at Rome, he represented the popular will, but his action indicated the authority and prestige which the Church had gradually but steadily gained during the past three centuries. For the invaders had been awed, ordered, and evangelized upon the whole by the Church. They were not barbarians. Only the fierce Huns deserve that name. The majority were ready to accept the higher and older civilization of the empire which they annexed. Some were Christians before they settled in the south, e.g. the Goths. They simply required to be brought over from Arianism to the Athanasian orthodoxy. Others were evangelized by the Church, all the more readily as the Christian religion presented itself to them as an element in the great civilization to which they were serving themselves heirs. Besides, the propaganda of missions was carrying the gospel up into Europe. The missionaries, largely recruited from the ranks of the monks, pushed their way through Gaul into the far north. Celtic monasticism, especially from Ireland, played a leading rôle in the advance, in Scotland, for example, and later in Germany.

English Christianity received a fresh and lasting impulse from the mission of Augustine towards the end of the sixth century, and this in turn flowed over into the Netherlands. During the unsettled days of the empire in the south, the Church maintained this forward movement, in addition to its great task of educating the new rulers of the south. One result of the development was the slow supersession of the monastic type by the episcopal, the centralization of authority in the hands of the Bishop of Rome, and the consolidation of a fairly homogeneous system of belief and worship throughout Northern and Western Europe.

By the eighth century the needs of Church and empire alike pointed to an alliance. The Church required the support of the empire for its work, the co-operation of the State for the task of welding a number of national Churches into a single organization. And the stability of the empire was felt to rest upon the authority of the Roman bishop, if anarchy was to be avoided. As yet no formal definition of the relations between the two powers was drawn. It was enough that both should form a working agreement, under the force of circumstances. The delimitation of civil and ecclesiastical jurisdictions lay in the future, and the struggles which arose over it constitute the outward interest of the Christian religion in Europe during the mediæval period.

This period, from the ninth to the sixteenth century, exhibits very different fortunes of Christianity in the East and in the West. At Byzantium the old line of the emperors lasted on, maintaining the splendours of the past, controlling the Church, and becoming more and more Oriental in spirit. No State and Church problem could emerge here. Nor was there any contact with vigorous thought, to induce the formulation of doctrine in any fresh synthesis, corresponding to the scholastic theology of the West. But down to the eleventh century Byzantine Christianity suffers little by comparison with Western; its scandals and corruptions are not worse than those of the Papacy; it maintained the continuity of the Christian tradition, and, although hampered by absolutism, managed to preserve its mystical and metaphysical tendencies. Above all, Byzantium checked for centuries the inroads of Islam.

It is one of the ironies of history

that the very movement which promised to carry Eastern Christianity in triumph over Islam led to the downfall of Byzantium itself. The Crusades began in the eleventh century. They were undertaken, it is true, at the appeal of the East, by the armed forces of Western Christianity, inspired and organized by Europe, which for three centuries rallied fitfully to the aid of Christendom against the common foe. But as time went on, the Crusades weakened Eastern Christianity. And their ultimate failure to recover the Holy Land from the Saracen power meant the ruin of Constantinople, which fell to the Turks in 1453. This catastrophe was produced, indeed, by the internal decay of Eastern Christianity, but it was precipitated by the effect of the Crusades on Byzantium itself. And the religious results were as unfortunate as the political. The prolonged conflict had strained the relations between the Eastern and the Western Churches. Instead of being drawn closer, the Greek and the Latin Churches fell apart. Friction rendered all attempts at reunion vain. National rivalry, political suspicions, and ecclesiastical feuds proved too strong to be overcome.

The Greek Church determined to be still mistress in her own house. The very name of " Orthodox " carried on her proud claim to represent the original Catholic Church of the early centuries, whose language and creed she cherished, against all pretensions of the Western Church. Constitutionally, she had no problem which involved any claim to Papal supremacy; the alterations of doctrine and polity which agitated the West left her undisturbed. As a result, Eastern Christianity was more conservative and less missionary. Shut off towards the south and east by Tartars and Saracens, she expanded, not across the Bosporus, but up into the Balkans and among the Slavs, her main missions being those to the Bulgarians and the Russians. The conversion of the Russians, which began towards the close of the tenth century, marks the culminating point of her outward evolution. Down to the fifteenth century, St. Sophia in Constantinople was for the East, and especially for Russia, what St. Peter's in Rome was for Europe, and the Russian Empire was destined to be the champion of Eastern Christianity, as the Roman Empire of Germany was of the Papacy, though on much less controversial lines.

Papacy.—For in the West the Papacy and the empire were meantime involved in a struggle which dominates the fortunes of Western Christianity. The episcopate of Rome had gathered round it a prestige and priority which, when the bishop was a man of force and character, as he occasionally was, led to still higher claims not only over the Church but over the State. The two claims were mixed up, but the rise of the Roman bishop to a positon of practical absolutism over his fellow-bishops was more easily granted than the corresponding claim to have jurisdiction over the civil authority.

The Papacy became the central and supreme court of decision in ecclesiastical matters throughout the West. Its jurisdiction came to cover not only administrative but legislative authority, however, and this precipitated the conflict with the secular authorities which passed through various phases from the ninth to the sixteenth centuries. The fortunes of war swayed sometimes in favour of the Pope, who now and then stood for liberty and conscience against the encroachments of the empire upon popular as well as ecclesiastical rights, sometimes in favour of the emperor, who might be called upon to purify the Papacy from corruptions or to protect it against Italian anarchy. But neither would consent finally to admit the prerogatives of the other.

In the twelfth century Hildebrand seemed to have won the day for the Papacy, but in the fourteenth century the rising national power of France proved too much for the triumphant Papal absolutism. What the German dynasties had failed to effect was managed by France. The mediæval period may be said to end with the beginning of the fourteenth century. Then follow the changes that herald the Reformation of the Church, the decay of the Papal authority during the residence of the Popes at Avignon, the scandal of rival Popes excommunicating each other, and the refusal of the Papacy to reform itself in face of demands from Christendom. By the fourteenth century it was beginning to dawn upon the minds of some men that the mediæval synthesis of the Papacy and the empire was impracticable, at least upon the old lines, that while a common civilization was invaluable against Islam and paganism, against social anarchy and religious dissensions, the temporal power of the Papacy, with its effort to raise a spiritual empire not only side by side but superior to the realms of Europe, was an anachronism which was having injurious effects upon national rights, social morality, and individual piety.

The Greek Church had never accepted the position of a refractory schismatic body, to which the Popes

claimed to relegate that great community. But the Greek defiance was remote, as a rule. What was more ominous was the rising of a European criticism directed not only against the means but against the ends of the mature Papacy; not simply against the corruptions of the Papal system or against its scholastic definitions in theology, but against the assertion of a lordship for the Church in the form of a supreme imperialistic theocracy, whose fundamental position was that for salvation everyone must be subject to the successor of Peter—everyone implying not only rulers and people as individuals, but everyone in any civil authority.

The keen struggle developed within the Church a structure of its own, i.e. a polity of hierarchical power mediated through the pontiff, a body of canon law, ruling the internal life of the Church by constitutional procedure which, under scripture and natural law, was drawn from decisions of councils and declarations of the Pope, and, finally, a scholastic theology, based upin Augustine's thinking, but independently attempting with extraordinary ability to solidify human thought in the spheres of reason and faith. The administrative and the speculative interests were combined. Taking over the inheritance of Augustine's theology, the scholastic theologians transformed and adapted it, on the basis of Aristotelianism, producing a vast "catholic" system of divine absolutism and sacramental grace, whose synthesis was meant to cover philosophy and practical life. As reason could flourish if it accepted the Church's supernatural definition of what truth was and of how truth was to be reached, so the ordinary man had his bliss secured by submission to the Church's impartation of supernatural grace through the sacraments, especially the eucharist or mass, which put him into a relation with God, guaranteed, intelligible, and comprehensive.

The synthesis ingeniously appealed to the highest as well as to the lowest in human nature. It produced saints, and at the same time did not bear too hardly upon the common man. The aim was to train, or at least to control, Europe by a moral discipline with supernatural sanctions, to uphold civilization by undermining heresy and immorality, and to establish social welfare upon Church principles. Such were the high ideals of mediæval Christianity, and in part they were occasionally realized. The Mediæval Church, as Lord Morley remarks, "amid many imperfections and some crimes, did a work that no glory of physical science can equal, and no instrument of physical science can compass, in purifying men's appetites, in setting discipline and direction on their lives, and in offering to humanity new types of moral obligation and fairer ideals of saintly perfection, whose light still shines like a star to guide our own poor voyage." But by the thirteenth century signs of a change were becoming plain. The feudalism which had given the Papacy its real opportunity was yielding to national monarchies of an absolutist type. And the Mediæval Church itself was deteriorating. The very mendicant orders, who in the thirteenth century rose to reform the Church, became themselves a reproach. The glowing impetus of the Franciscan and Dominican orders abated.

By the sixteenth century the clergy, the nuns, and the monks were often bywords in Europe, the butt of popular satire and contempt. And the repression of liberty, either in the field of thought or in national affairs, became increasingly difficult. Only those who were preoccupied with the struggle between the Papacy and the empire could ignore the fact that the elements of an explosion were gathering from various quarters.

These were in the main as follows: (*a*) The shock given to the prestige of the Papacy by the spectacle of Popes and Anti-Popes anathematizing each other, and the exasperation felt by Europe at their financial extravagance and rapacity. (*b*) The failure of the reform movement to obtain any satisfactory redress by means of councils in the fifteenth century. Abuses were for the most part ignored, criticism was defied, and Europe began to draw its own conclusions. (*c*) The rise of humanism in connection with the Renaissance, which meant an emancipation of the mind from clerical control, an examination of the documentary bases of mediæval religion, and, in its less pagan forms, a determination to reform the Church's practice. (*d*) The rising spirit of nationality, fostered by the Crusades, which resented more and more the interference of the Papacy with the internal affairs of a nation. The long contest with the empire had weakened the efficiency of the temporal power of the Papacy, till the very justice of it was challenged overtly by powerful States like France and England. (*e*) The movement for social reform, which among the Hussites and the Lollards, for example, assumed a religious character, and which denoted the emergence of fresh ideals vaguely but definitely challenging the feudal superiority of the Roman Church. (*f*) Finally, the spread of mystical piety in the

cloister and in praying circles throughout Europe.

This was not always hostile to the Church, but in its unorganized forms it produced groups of laymen who repudiated the Roman clergy and discipline. It was a lay movement, the outcome of true spiritual religion, which was not satisfied with the ecclesiastical order; it influenced chiefly artisans, stirred a desire for the Bible in the vernacular, and, although by no means homogeneous, worked upon the whole for a simplifying of Christianity. In its own way it was as significant as the more open questioning spirit aroused by the new learning.

The explosion came in the sixteenth century. The spark that lit the fire was the spirited protest of Luther, a German monk, against a shameless advocacy of indulgences by the Papal agent in Germany. In the interests of true religion Luther denounced the abuse. This was in 1517. The history of the four centuries since then has been for Christianity the development of the issues raised so abruptly in that year. They were wider than Luther or anyone else foresaw at the time. The forces and ideas of the new age all came into play, once the struggle began, and what seemed at first to be simply another local protest against Papal policy developed into what is known as the Reformation. The name is significant. The reformers aimed at "re-forming" not at destroying the Church.

When the Papal leaders refused to initiate reforms or to carry out those now demanded in practice and doctrine, the reformers set themselves to "re-form" the Catholic Church in accordance with the Word of God, believing that they were carrying on the true tradition of the Church, restoring the divine, apostolic ideal which had been corrupted by the mediæval Papacy, and convinced, as they broke the external unity of the Western Church, that they were upholding the only true unity of Christians, which was not bound up with any external organization but with faith and love. All believed that the Church was one. What they did not believe was that this unity was Papal. All believed that the Church must be reformed under the divine Spirit, instead of being committed to a traditional ecclesiastical order which had become materialized.

Centuries earlier the Eastern Church had parted from the Western upon a minor dogmatic issue; now half Christendom parted from the Western Church of Rome upon issues far more fundamental. The fact that the Reformation was not a homogeneous movement but a spontaneous rising against the Papacy, naturally meant that some reformers went to greater lengths than others; the conservative elements and the radical in the religious sphere went their own way in reconstructing what they deemed the true Church. Also, the Reformation took up more factors than those of a religious revival. Many sympathized with it and even joined it who were principally actuated by a desire to check abuses and corruptions, just as many were moved by the impulse of revolt against intellectual repression. Besides that, the nations had often their own grudges against the Papal regime, and these entered into the situation.

The result was that for the next two centuries Western Christianity exhibits the spectacle of reformation and counter-reformation, the Reformed Churches finding their feet, struggling often with one another as much as with Rome, and Rome endeavouring to regain lost ground. As the Reformation took shape, it was realized that the fundamental principle was not the right of individual judgment but the right of the Christian to come into direct touch with God—in other words, the priesthood of all believers, a privilege which, according to the reformers, had been denied by the Mediæval Church when it interposed its own tradition between God's word and the soul, and made pardon dependent upon absolution from a priest. This position led to a more or less thorough break with the entire sacramental and hierarchical system of the Mediæval Church. But there was no agreement upon details, and often serious diversity of opinion upon the extent to which Christians were justified in retaining any materials of the mediæval structure.

The Roman Church settled its house more rapidly and effectively. The reactionary party triumphed at the Council of Trent, mainly owing to the policy of the Jesuits, an order founded by the ardent young Spaniard Loyola and authorized by the Pope in 1540 to contend against heretics and infidels. The Council of Trent (1545-63) may have "impressed upon the Church the stamp of an intolerant age, and perpetuated by its decrees the spirit of an austere immorality" (Lord Acton), but it succeeded in consolidating the Roman forces, in organizing a powerful current of opinion against the reformers, and in confirming the Papal supremacy. Some of the most glaring abuses were dealt with; the clergy were summoned to fresh zeal; and the polemical, positive statement of the Roman doctrine was elaborated with subtlety and precision. No party

contributed more to this result than the Jesuits, who threw themselves into a social, educational, and revivalist propaganda which made their foreign missions a triumph outside Europe, and itself ensured their success within the European Churches.

An ascetic intensity of religion breathed through the order. But the counter-reformation relied upon other forces as well, principally upon the power of Spain. Through the subservience of Spain the Roman Church not only succeeded in imposing absolute authority upon its European subjects, and in changing Romanism from a European to a Latin form, but in attacking politically the champions of the reformed faith. The struggle ended in the overthrow of Spain, which was first checked in the Netherlands and then worsted in the fight with England. By the sixteenth century the counter-reformation had reached its height, and the political fortunes of the respective Churches in Europe were substantially settled.

The vital connection of the Papal religion with the entire fabric of social and political life made any religious change the source of far-reaching unrest and unsettlement. It was inevitable that the fresh interpretation of the faith which the reformed Churches undertook should involve not merely a variety of ecclesiastical forms, each claiming to supersede the mediæval type by a purer, but numerous civil experiments, the nature and success of which depended largely upon the characteristics of the various nations in Europe.

All the three forces which in the main dominated the situation at the opening of the sixteenth century served at once to forward and to deflect or check the reformation of the Church. The mystical piety partly lived on within the Roman Church, partly swelled the forces of the new faith, reappearing in later forms like Pietism and the Quaker movement, i.e. in groups and societies where the inner light was emphasized; it contributed divisive and inspiring elements to the new reconstruction, and assumed forms which varied from quietist conventicles to revolutionary parties. The humanist movement also stirred elements favourable to the reformed faith in certain quarters, but partly remained content with the mediæval system and partly reacted against the new faith, according as it emphasized its semi-pagan or its religious ideals. The impulse to reform not merely the Church but society similarly worked along various lines; in the Reformed Churches and nations it frequently compromised the religious party by its extravagances, and encountered an opposition which was politically conservative although advanced religiously. These chaotic cross-currents help to explain the differences of fortune and form which are to be traced within the reforming Churches during the next two centuries. The struggle between the forces of progress and reaction was much more visible and vital inside the reforming Churches than inside the Roman.

In the latter, Christianity was already organized on lines familiar and traditional, which could be drawn closer without much difficulty. In the reforming Churches, where the organization had to be developed afresh out of the varying conceptions of divine grace, and in accordance with varying interpretations of the Bible, both religious interests and political combined to set up a bewildering variety of ecclesiastical and doctrinal forms, as well as of social problems.

In Germany, for example, the reforming movement was driven by its own impetus to challenge the entire Papal system, and, in reliance upon local rulers, to develop in Lutheranism a form which doctrinally differed from Swiss and Calvinistic religion, especially in relation to the conceptions of the Church and of the eucharist, while it involved a close tie between the civil polity and the Church. This particular expression of the reformed faith did not extend beyond Germany, however, except to Scandinavia, where the Reformation was introduced mainly on account of political considerations.

In Calvinism, which spread from France to Switzerland, the form taken was less dependent upon the State, more republican, and therefore more aggressive. Calvin's restatement of Christianity raised a Church more consolidated than elsewhere. Its practical embodiment at Geneva inspired the reformers in Europe with energy to meet the counter-reformation. "Calvinism saved Europe," says Mark Pattison. It breathed vigour and definite conviction into the Netherlands and Scotland, as well as into France, and enabled the new faith to consolidate itself effectively against persecution and opposition.

In France the Reformation passed from an initial humanist and mystical movement into a popular break with the Roman Church, which became involved with national issues, and eventually, after the prolonged wars of religion, ended in the ejection of the Huguenots during the seventeenth century—a policy for which France suffered politically and socially. The Reformation did not suffer here so

fatally from the Inquisition as in Spain, but it ceased to hold the nation, and Protestants became no more than a tolerated minority.

The Netherlands, on the other hand, vindicated their independence against Spain. Scotland, swept by a popular rising, broke the Roman power, organized itself on Calvinistic lines under Knox, and thereafter found its internal problems in the struggle with England. England, again, had been carried into the struggle by the popular resentment of Papal interference, which Henry VIII. adroitly turned to his own ends. Here, more than anywhere else, the doctrinal rupture with the mediæval system was tentative. The controlling motive, even under Elizabeth, was political, a suspicion of Roman intrigues against the throne and the liberties of the realm.

Eventually the Church settled down upon a constitution which was mediating, but extremer views struggled for expression. Continental influences fostered Puritanism, and the result was a cleavage within the national religion, heightened by factors drawn from the Scottish situation. One channel for this tide of piety was opened by the conquests of England in America, which during the seventeenth century enabled the Puritans to colonize at peace beyond the bounds of England, a privilege denied to the French Huguenots, who were strictly forbidden to enter the French possessions in Canada.

During this period the need of systematizing the new doctrine led to what may be called reformed scholasticism, which differed from mediæval scholasticism in abjuring Aristotle, in being heterogeneous and sectarian, and in concentrating upon doctrines like the atonement, the person of Christ, and predestination. The results were extremely complicated. No measure of success was attained in discovering any synthesis which would reconcile the divergent views of the reformers. And what contributed more than anything to the failure was the indifference of this scholasticism to contemporary philosophy; the reforming faith was still mediæval rather than modern in its outlook, and unduly isolated from the currents of thought and feeling which were running through Europe.

For Europe was now ceasing to be the world. The discoveries of the Portuguese in the Far East had wakened Europe as far back as the fifteenth century to the existence of China, Japan, and India, as well as to the wider world outside the Mediterranean. Already missions had been carried thither. The Crusades had opened the eyes of many to the nearer East. The new astronomical discoveries, and above all the exploration of America, South and North, extended the horizon. Such factors, besides the invention of printing, made for a larger vision, and the interpretation and application of Christianity was certain to be affected, especially within the reformed communities where liberty of thought was claimed, if it was not always practised. Hence the reformed orthodoxy, which in many ways attempted to carry on the mediæval synthesis of a doctrinal setting for human existence, was challenged, not simply by forces like those of pietism and mystical speculation, but by the rising claims of rationalism, especially in Holland and in England. From the seventeenth century onwards the fortunes of Christianity in the Reformed Churches of Europe are dominated by the activity of historical criticism and philosophical speculation, both of which contained rich materials for an advance in faith and practice, although they were exaggerated and suspected at first.

The crucial question was no longer creeds but the vital principles of Christianity, the relations between religion on the one hand and philosophy and history upon the other. Fundamental issues were raised, as they had been in the age of mediæval scholasticism, only upon the new ground of criticism. This involved the whole problem of authority in the Church, with its corollaries of the inspiration of the Bible and the relation between Church and State. Nor was the period absorbed in doctrinal issues. From time to time the vital, pulsing life of the Reformed Churches threw up movements of practical religion, revivals like those of the Moravians, of Wesley and Whitefield, and even within the Roman Church, which suffered less from doctrinal disputes, a series of convulsive struggles like those connected with the names of Molinos and Jansen, especially in the French Church.

Since then the characteristics of the Roman Church have been, in the main, the gradual increase of the Papal authority, marked by the declaration in 1870 of the Pope's infallibility, the reaction, as gradual but as definite, against speculation, which has set in during the inhibition of modernism, and the reassertion of the Thomist or mediæval basis of doctrine. These, together with real revivals of piety, have increased the attractive power of the Roman Christianity both at home and abroad, especially as they have been accompanied by educational propaganda and heroic missionary enterprise. But, apart from special Church poli-

tics, the outstanding features of Christianity during the modern period, i.e. during the years since the opening of the nineteenth century, are too broad to be identified rigidly with the story of any one Church. The issues at stake are fundamental. The influences are felt by all Churches more or less. They may be summed up roughly as follows:

(*a*) A franker outlook upon the relations of Christianity to the other religions of the world. This has been brought about by the contact between Europe and the outside world, the study at first hand of the ancient religions, especially of the East, and the internal analysis of the Christian religion itself by the critical processes of thought. The new science of comparative religion has come to its own. Philosophically the problem shapes itself as that of the absoluteness and finality of the Christian religion. Practically it emerges in the field of missions, where it is no longer regarded as feasible or even desirable to impose Christianity simply as a form of Western religion upon other races. The reaction of mission experience upon the interpretation of dogma is becoming increasingly felt.

(*b*) Hence the need for restating the essentials of the Christian faith, in relation not only to contemporary thought but to national aspirations and social ideals, becomes paramount. This is less than ever a merely speculative interest. It is imperative in view of the questioning spirit stirred by conceptions of society which base themselves upon economic and materialistic views of progress. The problem raised at the Reformation is now seen to be much more serious than was realized by the sixteenth century. It is no longer possible to assume as axiomatic what the first reformers for the most part took as an unchallenged presupposition of Christianity. The philosophical, scientific, social, and ethical implicates of the Christian faith, require to be thought out, it is felt, more radically, the problem being to discover the temporary and the permanent elements of the faith itself, and to disentangle these from one another.

(*c*) As one result of this movement, there is an increasing tendency in some quarters to challenge more or less thoroughly the connection of Christianity with organized religion. The cry "Back to Christ" is, like the cry "Back to Kant" in philosophy, the motto of an advancing school—at any rate of a school which wishes to advance. It is impatient of traditional methods, critical of established forms, and disposed to find an antithesis between the religion of Jesus and the religion of Christianity. The strain to which all institutions are exposed is telling upon Christianity as well. Account has to be taken of the widespread conviction, for example, that there is no divine right in any one system of Church government, and that the living spirit of Christianity must be left free to express itself in a variety of forms, doctrinal and ecclesiastical, none of which can be regarded as binding upon all and sundry among those who profess the name of Christian.

(*d*) With this, partly as a result, partly as a protest, there is a growing desire for reunion among a number of the Churches. The differences which keep them apart are now recognized to have been often founded upon inadequate examination of tradition, or upon local and temporary causes which have ceased to operate. The sense of the vital union of Christians is more felt than realized as yet in practice. But the traditional dissidence of Protestantism is waning under the increasing need for co-operation in missions and under the broader study of the essentials of the faith. It is upon the latter that the future of this movement depends. The practical outcome rests with the inward analysis of Christianity rather than with any readjustments of ecclesiastical agencies.

(*e*) The reaction against individualism is also telling in favour of a new emphasis upon the Church. The two foci of the ellipse in Christianity are the individual and the kingdom of God, the human soul in touch with its Creator and Father, and the society in which the divine revelation is realized. Ever since the Romantic movement with its return to history, after the eighteenth century, and the Ritschlian movement in theology with its emphasis upon the kingdom as paramount in Christianity, the older strain of the significance of the Church in Christianity has become louder. The antithesis between form and spirit is seen to be misleading, as it was put by controversialists. There is a disposition to find some middle way between subjective piety and a rigid ecclesiastical system. The debatable point is still the definition of such a Church, e.g. how far it can be national and yet in the true sense of the term "catholic," raised above sectarian and class interests and yet authoritative, supernatural and yet flexible to the demands of human life, possessed of freedom and yet invested with the

requisite powers of discipline, a unity and yet capable of affording scope for the developments of idiosyncrasies and individual energy.

These characteristics of Christianity in the period which may be termed "modern" indicate tendencies at work which have been thrown up by local and national changes too intricate and detailed to be surveyed even in outline. The ramifications of Christianity are upon a scale beyond anything contemplated by the mediæval mind. It is no longer Europe but the world which confronts Christianity, and a world rich in potentialities, seething with ideas, and no longer under any single religious spell.

The task of Christianity is to interpret itself, and to interpret the world. Not merely science and philosophy, but the urgent social problems of civilization, are making this a necessity of existence for the faith. The attempts to meet it may be disconcertingly varied, but they are one proof of vitality. And another is the tendency to fall back upon the essentials of Christianity, without assuming that this means a minimum.

Finally, a word may be added upon statistics. These cannot be given except approximately, but the following estimates give a fair idea of the extension of the religion. In 1909 it was computed that out of 1550 millions—the total number of human beings on earth—about two-thirds were non-Christian; Mohammedans numbered 225 millions, Jews about 11 millions, and Christians 555 millions. Of the nominal Christians 175 millions were Protestants, 120 millions belonged to the Greek Church, and 260 millions to the Roman. In 1920 the estimate runs: out of 1646 million people in the world, 12 millions are Jews, 221 millions Mohammedans, and 564 millions Christians.—BIBLIOGRAPHY: H. M. Gwatkin, *Early Church History to* A.D. 313; L. Duchesne, *Early History of the Christian Church from its Foundation to the End of the Fifth Century*; F. X. Funk, *Manual of Church History*; Harnack, *History of Dogma*; P. Schaff, *History of the Christian Church*; Carlyle and Bartlet, *Christianity in History*; Viscount Bryce, *The Holy Roman Empire*; *Cambridge Mediæval History* (vol. i.); *Cambridge Modern History* (vols. i-iv.); T. M. Lindsay, *The Reformation*; A. C. M'Giffert, *Rise of Modern Religious Ideas*; Otto Pfleiderer, *The Philosophy of Religion*; G. Galloway, *The Philosophy of Religion*; B. G. Foster, *The Finality of the Christian Religion*; E. C. Moore, *West and East*.

CHRISTIAN KNOWLEDGE, Society for Promoting (S.P.C.K.). A society founded in London in 1698, in connection with the Church of England, having for its main objects the establishment of churches, schools, and libraries, and the publication and circulation of religious and moral literature. It is still in active operation, and publishes a great number of religious and instructive works. In 1811 the National Society branched off from it, and has done much to further education in England in connection with the Established Church. It is carrying on educational work not only in England, but also in India, Australia, Japan, Africa, Burmah, and America. Exclusive of Bibles, prayer-books, and tracts, the circulation of the society's publications is over 11,000,000.

CHRISTIANSAND. A seaport in the south of Norway, the see of a bishop, with manufactures of tobacco and machinery, brewing, etc., and a considerable export of timber and fish. Pop. 16,605.

CHRISTIAN SCIENCE. A view or theory regarding, and method of dealing with, human ailments or diseases and their cure, owing its origin to an American, Mrs. Mary Eddy, who arrived at her discovery of the science of mind-healing about 1866. She began to make her ideas known in 1867, and in 1875 published a book entitled *Science and Health, with Key to the Scriptures*, which serves as the textbook of Christian Scientists. The first church of the sect or body was established at Boston, United States, in 1879, with Mrs. Eddy as its minister; and since then many churches have been established in various parts of the world, the total number of adherents being probably over a million.

The main religious doctrines of Christian Scientists are those of Christians in general, but they set little store by dogmas or ecclesiastical forms and ceremonies; among their special beliefs—beliefs of practical importance in regard to disease—are that matter has no real existence; that nothing is real but mind; that matter only seems to exist; and that the impressions given by our so-called senses are not real, but exist only in our thoughts, are only "mortal beliefs," so that disease and pain are mental delusions, without reality, and would have no existence if one had a true knowledge of "immortal truths" and of God. To get rid of them we must strive to arrive at the true nature of God and our relation to Him who is the base of all existence, the all in all.

Christian Science demands the entire surrender of the human will to God. It denies that Jesus is God, but acknowledges the atoning sacrifice of the Saviour, finding, however, the essential efficacy of His atonement in His life, in His teaching and demonstration of truth. "Christ," writes Mrs. Eddy, "is the ideal Truth, that comes to heal sickness and sin through Christian Science, and attributes all power to God. . . . Jesus is the human man, and Christ is the divine idea."

There are a number of Christian Scientists specially appointed to practise the mind-cure, whose method, partly at least, consists in prayer. Several periodicals are published in connection with the body, in Europe as well as in America, and a good deal of literature is distributed.—BIBLIOGRAPHY: M. B. Eddy, *Science and Health, with Key to the Scriptures*; G. Milmine, *Life of M. B. G. Eddy*; C. H. Lea, *A Plea for the Thorough and Unbiassed Investigation of Christian Science*; W. F. Cobb, *Spiritual Healing*; E. E. Weaver, *Mind and Health*; Stephen Paget, *The Faith and Work of Christian Science*.

CHRISTIANS-ÖE (*-eu-ö*). A group of three small islands in the Baltic, belonging to Denmark, named from the chief island, which has a harbour of refuge and a lighthouse.

CHRISTIANS OF ST. JOHN. A sect found in Mesopotamia and Turkey, chiefly in the neighbourhood of Bassorah. They profess to follow the teaching of John the Baptist, and are wrongly called Christians since they reject Christ, and are practically heathens, whose deities are darkness and light. They are called also Mendeans, Mendaites or Mandaites, and Sabians.

CHRISTIANS OF ST. THOMAS. The name of a sect of Christians on the coast of Malabar, in India, to which region the Apostle St. Thomas is said to have carried the gospel. They belong to those Christians who, in the year 499, united to form a Syrian and Chaldaic Church in Central and Eastern Asia, and are, like them, Nestorians.

CHRISTIANSTAD. A town, Sweden, capital of the län or government of same name, on a peninsula in the Helge Lake, about 10 miles from the Baltic, with manufactures of gloves, linen and woollen fabrics, and some trade through the port of Ahus, at the mouth of the Helge. Pop. 13,515.

CHRISTIANSTED. A fortified town, capital of the Island of Santa Cruz or St. Croix, which belonged to Denmark until 1916, when it was sold to the United States. It has a good harbour and some trade. Pop. 5480.

CHRISTIANSUND. A seaport town on the N.W. coast of Norway, 82 miles S.W. of Trondheim, on three islands which enclose its beautiful land-locked harbour. It carries on a trade in dried and salted fish. Pop. 15,050.

CHRISTIE'S. An auction-room in London, famous for its art sales. Established in 1766 by James Christie, it now belongs to the firm of Christie, Manson, & Wood. Many sensational sales have taken place at Christie's, among which the following may be mentioned: the Hamilton Palace Collection (1882), realizing £397,562; the Bernal Collection (1855), realizing £70,954; the Manley Hall Collection (1875-78), realizing £150,000; the Fountaine Collection (1884), realizing £96,200; the Dudley Collection (1892), realizing £99,564; the Magniac Collection (1892), realizing £103,040. The sale of Sir Julian Goldsmith's pictures and furniture in 1896 realized £101,727, and the sale of Sir John Pender's pictures in 1897 brought in £81,913. The Duke of Cambridge's pictures and jewels, sold at Christie's in 1904, brought in £89,734, and the sale of Mrs. Lewis Hill's jewels in 1907 realized £95,000.

In April, 1915, an auction was organized at Christie's for the funds of the Red Cross Society. The pictures, drawings, and miscellaneous articles were presented by well-known donors, and realized over £37,000.

CHRISTI'NA. Queen of Sweden, daughter of Gustavus Adolphus, born 1626, died 1689. After the death of Gustavus, at Lützen, in 1632, the States-General appointed guardians to the Queen Christina, then but six years old. Her education was continued according to the plan of Gustavus Adolphus. She learned the ancient languages, history, geography, politics, and renounced the pleasures of her age in order to devote herself entirely to study. In 1644 she took upon herself the government.

A great talent for business, and great firmness of purpose, distinguished her first steps. She terminated the war with Denmark begun in 1644, and obtained several provinces by the treaty concluded at Bromsebro in 1645. Her subjects wished that she should choose a husband, but she manifested a constant aversion to marriage. During this time her patronage of learned men, artists, and the like, was lavish.

In 1650 she caused herself to be crowned with great pomp, and with the title of *king*. From that time a striking change in her conduct was perceptible. She neglected her ancient ministers, and listened to the advice of ambitious favourites. Intrigues and base passions succeeded to her former noble and useful views. The public treasure was squandered with extravagant profusion.

In 1654 she abdicated in favour of her cousin Charles Gustavus, reserving to herself a certain income, entire independence, and full power over her suite and household. A few days after she left Sweden and went to Brussels, where she made a public entry and remained for some time. There she made a secret profession of the Catholic religion, which she afterwards publicly confirmed in Innsbruck. From Innsbruck she went to Rome, which she entered on horseback in the costume of an Amazon, with great pomp. When the Pope Alexander VII. confirmed her, she adopted the surname of *Alessandra*. For some time she resided at Paris, and incurred great odium by the execution of her Italian equerry Monaldeschi for betrayal of confidence.

Subsequent attempts which she made to resume the crown of Sweden failed, and she spent the rest of her life in artistic and other studies at Rome. She left an immense art collection and a large number of valuable MSS. Her writings were collected and published in 1752.—BIBLIOGRAPHY: F. W. Bain, *Queen Christina of Sweden*; J. A. Taylor, *Christina of Sweden*.

CHRIS'TISON, Sir Robert, Bart. Eminent physician, born at Edinburgh 1797, died 1882. A specialist in toxicology, he was appointed to the chair of medical jurisprudence in Edinburgh in 1822, and in 1832 he was promoted to that of materia medica. He was twice president of the Royal College of Physicians, president of the Royal Society of Scotland, and ordinary physician to the queen in Scotland. He was D.C.L. of Oxford and LL.D. of Edinburgh, and was elected rector of the latter university in 1880.

CHRISTMAS (kris'mas; *Cristes Maesse* in late O.E.), the festival of the Christian Church observed annually on 25th Dec. in memory of the birth of Christ, and celebrated by a special church service. The time when the festival was first observed is not known with certainty; but it is spoken of in the beginning of the third century by Clement of Alexandria, and in the latter part of the fourth century Chrysostom speaks of it as of great antiquity.

As to the day on which it was celebrated, there was long considerable diversity, but by the time of Chrysostom the Western Church had fixed on the 25th of Dec., though no certain knowledge of the day of Christ's birth existed. The Eastern Church, which previously had generally favoured the 6th of Jan., gradually adopted the same date. Many believe that the existence of heathen festivals celebrated on or about this day had great influence on its being selected; and the Brumalia, a Roman festival held at the winter solstice, when the sun is as it were born anew, has often been instanced as having a strong bearing on the question.

In the Roman Catholic, Greek, Anglican, and Lutheran Churches there is a special religious service for Christmas Day; and, contrary to the general rule, a Roman Catholic priest can celebrate three masses on this day. Most other Churches hold no special service, but almost everywhere throughout Christendom it is kept as a holiday and occasion of social enjoyment.

Most of the Christian customs, however, now prevailing in Europe are not genuinely Christian, but heathen customs, absorbed or tolerated by the Church. These customs are inherited chiefly from two sources—from Roman and from Teutonic paganism. The cradle of Christ, the object of reverence in the Roman Catholic Church, is borrowed from the cult of Adonis, and Christmas games from the Roman Saturnalia. The use of evergreen and of the fir tree, a German custom which is first mentioned in the seventeenth century (1605), and was introduced into France and England in 1840, was adopted at first through analogy with the *Maienbaum*.—BIBLIOGRAPHY: L. Duchesne, *Origines du culte chrétien*; A. Tille, *Yule and Christmas*; C. A. Miles, *Christmas in Ritual and Tradition*.

CHRISTMAS-BOXES. Boxes in which presents were deposited at Christmas; hence a Christmas gift. The custom of bestowing Christmas-boxes arose in the early days of the Church, when boxes were placed in the churches for the reception of offerings; these boxes were opened on Christmas Day, and their contents distributed by the priests on the morrow (Boxing Day).

CHRISTMAS CARDS. Ornamental cards containing words of Christmas greeting to friends to whom they are sent. The first of them appeared about 1862, and consisted of pictures

of robins, holly, etc.; since then highly artistic designs have been introduced, and their manufacture has become a considerable industry in Germany, France ,and England. Immense quantities of them pass through the post office every Christmas. Christmas cards and boxes are both a survival of the *strenæ* (étrennes) of the Roman 1st Jan., bitterly condemned by Tertullian.

CHRISTMAS ISLAND. An island belonging to Britain, annexed in 1888 (being then uninhabited), about 250 miles south by east of the western extremity of Java, rising to the height of nearly 1600 feet; area, 20 sq. miles; densely covered with forest trees and bushes, and rich in phosphate, which is mined and exported for use as a fertilizer. It is politically connected with Singapore. The inhabitants number about 1043 (1926), nearly all connected with the phosphate industry. There is another British island of the same name, annexed to the Gilbert and Ellice Island Colony in Nov., 1919. Pop. 42.

CHRISTMAS ROSE. The *Helleborus niger* (black hellebore), so

Christmas Rose (*Helleborus niger*)

called from its flower, which resembles a large white single rose; its foliage is dark and evergreen, and the plant blossoms during the winter months.

CHRISTOPHE (kris'tof), **Henri,** King of Hayti, was born in the West Indies in 1767, and was employed as a slave in St. Domingo on the outbreak of the blacks against the French in 1793. From the commencement of the troubles he signalized himself by his energy, boldness, and activity in many fierce engagements. Toussaint-L'Ouverture gave him a commission as brigadier-general, and he was largely instrumental in driving the French from the island.

After the death of Dessalines, Emperor of Hayti, Christophe became master of the northern part of the island. In 1811 he had himself proclaimed King of Hayti by the name of Henri I. He also sought to perpetuate his name by the compilation of the *Code Henri*—a digest founded upon the *Code Napoléon*. His cruelty provoked a revolt, which he was unable to quell, and so he shot himself (1820).

CHRIS'TOPHER, St. A martyr of the early Church, beheaded in Asia Minor, according to tradition, in the year 250. He is invoked against lightning, storms, epilepsy, and pestilence. The Eastern Church celebrates his festival on the 9th of May, the Western on the 25th of July.

CHRISTOPHER'S, St. (commonly called **St. Kitt's**). A British island in the West Indies, one of the Leeward Islands, 23 miles in length, and in general about 5 miles in breadth; area, 65 sq. miles, of which about 17,000 acres are appropriated to the growth of sugar, and 4000 to pasturage. The interior consists of many rugged precipices and barren mountains. Of these the loftiest is Mount Misery (evidently an extinguished volcano), 4100 feet high. The chief town, a seaport with open roadstead, is Basse-Terre (pop. 7736). The island has a legislature of its own, with an executive subordinate to the Governor of the Leeward Islands, resident in Antigua. It was discovered by Columbus in 1493, and colonized by the English in 1623. Pop. 35,715.

CHRISTOPU'LOS, Athanasios. The best of modern Greek lyric poets, born in 1772 at Kastoria, in Macedonia, died 1847. His reputation as a poet rests on his *Erotika* and *Bacchika* (Love and Drinking Songs), which have been several times collected and printed under the title of *Lyrika*. He was also the author of an *Æolian-Doric Grammar*, and translated into modern Greek parts of the *Iliad* and of Herodotus.

CHRIST'S COLLEGE. One of the colleges of the University of

Cambridge, founded by Margaret, Countess of Richmond and Derby, mother of Henry VII., in 1505. An earlier college known as God's House, founded by Henry VI. in 1439, was merged into this college.

CHRIST'S HOSPITAL (generally known by the name of **Blue-coat School**, the title having reference to the costume of the boys educated there). A school in London, founded by Edward VI., for supporting poor children. The boys' school was removed from Newgate Street to Horsham in 1902, and 820 boys are here boarded and educated, while there is a girls' school (for 280) at Hertford. Both classics and modern subjects are taught. Entrance to the schools is partly by nomination, partly by competition, and for two-thirds of the scholars fees may be charged, if the parents or relatives can afford them. There are exhibitions to the Universities of Oxford and Cambridge and other prizes (including payment of apprentice fees, etc.). Many distinguished men have been connected with Christ's Hospital, notably Coleridge and Lamb.

CHRIST'S THORN. The *Paliūrus aculeātus*, a small thorny shrub, ord. Rhamnaceæ, with small shining ovate leaves and yellowish-green clustered flowers. It is common in the south-east of Europe and Asia Minor, and some suppose it to have been the plant from which the Jews plaited the crown of thorns for our Saviour. *See* JUJUBE.

CHROMAT'IC. In music, a term applied to notes and peculiarities not belonging to the diatonic scale. Thus a *chromatic chord* is a chord which contains a note or notes foreign to diatonic progression; *chromatic harmony*, harmony consisting of chromatic chords. The *chromatic scale* is a scale made up of thirteen successive semitones, that is, the eight diatonic tones and the five intermediate tones.

CHROMAT'ICS. The science of colours; that part of optics which treats of the properties of the colours of light and of natural bodies. *See* PIGMENTS.

CHROMATIN (Gr. *chroma*, colour). In cells, that part of the nucleus which stains deeply on applications of aniline and other dyes. It is usually in the form of a network, which undergoes complicated changes during cell-divisions. It is believed to be the bearer and transmitter of hereditary characteristics.

CHROMATOPHORE, or **PLASTID.** An important organ of the vegetable cell, found in all self-supporting plants. The name signifies "colour-bearer," and the most familiar chromatophores are the carbon-assimilating *chloroplasts*, coloured green by chlorophyll; among Algæ, these are often large, elaborate in form, and few in each cell (e.g. Spirogyra), but in higher plants every green cell typically contains many small, round or ellipsoidal chlorophyll corpuscles.

Chromoplasts are the yellow or orange plastids found in petals, fruits, etc., where they help to attract pollinating or fruit-dispersing animals. Colourless cells of green plants contain either *amyloplasts* (e.g. potato tuber), plastids which form starch from soluble carbohydrate material, or *leucoplasts*, embryo chromatophores which under appropriate conditions may develop into any of the above-mentioned functional forms (e.g. egg-cells of angiosperms, many epidermal cells, etc.). *See* CHLOROPHYLL; EPIDERMIS: RED ALGÆ.

CHROME GREEN (krōm). The green oxide or sesquioxide of chromium, forming a green pigment used by enamellers.

CHROME IRON-ORE, or **CHROMITE.** The chief ore of chromium, much in demand in connection with the steel industry and the pigment trade. It resembles magnetite, but is red and translucent in very thin flakes, and is a member of the interesting "spinellid" series of minerals generalized as $RO{\cdot}R_2O_3$, all crystallizing in octahedra, with magnetite at one end and spinel at the other. In chromite the oxides present are those of chromium, iron, aluminium, and magnesium.

CHROME YELLOW. A chromate of lead, a beautiful pigment, carrying in shade from deep orange to very pale canary yellow, much used in the arts.

CHROMITE. Black or brownish-black mineral. It is composed of the chromates of iron, alumina, and magnesia, and used as the chief ore of the metal chromium. It is associated with serpentine rock, in which it occurs in large masses, or as concretions and veins. In New Caledonia, from the decomposed serpentine, the chromite is washed out to form a black sand on the seashore. Southern Rhodesia is one of the chief sources of the supply of chromite.

CHRO'MIUM (chemical symbol, Cr; atomic weight, 52). A greyish-white metal which shows some resemblance to iron. It was discovered by Vauquelin, a French chemist, in 1797. It does not occur

native, but in combination with oxygen and metals, especially as chromite, $FeO{\cdot}Cr_2O_3$, or chrome iron-ore, and in smaller quantity as crocoisite, $PbCrO_4$, in Turkey, Greece, Siberia, and New South Wales. The metal is obtained by reducing the oxide Cr_2O_3 with aluminium, and is manufactured for the preparation of several important alloys, to which it gives great hardness. Thus it is used in the preparation of hard steels, chrome steel being very hard and resistant to fracture. Steel alloyed with small quantities of nickel and chromium is used for armour-plating.

Several compounds of chromium are of importance: chrome alum, $Cr_2(SO_4)_3{\cdot}K_2SO_4 24H_2O$, is used in calico-printing and in tanning. Potassium dichromate, $K_2Cr_2O_7$, and sodium dichromate, $Na_2Cr_2O_7$, are used in large quantities as mordants, especially in dyeing wool, in photography, as oxidizing agents in the preparation of various organic chemicals, and as bleaching agents with sulphuric acid for some oils.

Chromates of other metals are known, and these are used in many cases as pigments. The colour of the emerald and beryl is due to small quantities of oxide of chromium, and this oxide, Cr_2O_3, chromium sesquioxide, is prepared and used as a green pigment for imparting colour to glass and porcelain. All chromium compounds are prepared from chrome iron-ore.

CHROMO-LITHOGRAPHY. Printing in colours by lithography (q.v.). A method of colour reproduction applicable to a large variety of originals, from simple crayon sketches, pastels, water-colours, etc., to elaborate oil-paintings. It is effected by a number of successive printings, one for each colour, so arranged as to give, when completed, as close a facsimile as possible of the original picture. The preparation of the "stones" for the different colours involves skilled handwork and considerable experience. Sometimes as many as twenty printings are employed, the lighter shades being printed off first, and the darker shades last.

The most highly finished examples of this method came from the Continent during the latter part of the nineteenth century, when "chromos," as they were popularly called, were familiar features in the homes of the people. The heavy oily character of these prints, however, due to the fatty nature of the printing-inks and the numerous layers of colour, does not lend itself to artistic results; and for pictorial purposes chromo-lithography is now practically superseded by more recent methods of colour reproduction. (*See* PROCESS WORK.)

So far as book illustrations are concerned, the present-day uses of chromo-lithography are chiefly confined to the printing of maps, for which it is admirably adapted. The process is also employed for commercial work, such as the production of coloured labels in vast quantities, and for advertisement "posters," which call for broad effects and large masses of flat colours.

CHRO'MOSPHERE. A gaseous envelope surrounding the sun, and overlying the photosphere, or inner envelope of incandescent matter. It is seen in total eclipses as a red-coloured circle. Portions seen projecting from it are called "prominences," "protuberances," or "red flames." Till 1868, when Jansen and Lockyer almost simultaneously pointed out a method of viewing it by the spectroscope, it was never seen except during eclipses.

It exhibits a spectrum of bright lines, indicating incandescent gases, mainly hydrogen, in the most elevated portions, and metallic gases or vapours lower down, and has a depth of about 6000 miles. "Quiescent" prominences, composed chiefly of hydrogen and helium, resemble clouds of our atmosphere, and may remain unaltered for days. They appear in all solar latitudes. "Eruptive" prominences, which consist mainly of metallic vapours ejected from the lower regions in violent eruptions, may shoot out to 100,000 miles in an hour's time. They frequent the sun-spot zones, and vary in number like the spots in an eleven-year cycle.

An eruptive prominence, photographed on 26th May, 1916, by Mr. Evershed at Srinagar, Kashmir, has an outward velocity of 120 miles per second. Finally its fragments were traceable to 500,000 miles—more than the sun's radius, and probably the greatest height a prominence has been observed to reach. A prominence of a quieter nature, but the largest of its kind ever recorded there, was observed at the Yerkes Observatory in May, 1919. It became entirely detached from the chromosphere, and reached an altitude of 200,000 miles, with a horizontal measurement of 340,000 miles.

CHRON'ICLE. A history arranged according to the order of time. In this sense it differs but little from *annals*. The term is mostly used in reference to the old histories of

nations written when they were comparatively rude. The histories written in the Middle Ages, some in verse, some in prose, are known as chronicles. The oldest chronicle in English literature is the Anglo-Saxon chronicle. Other well-known chronicles are the works of Froissart, Monstrelet, Fabian, Hardyng, Hall, Holinshed, Stowe, and Baker.

CHRON'ICLES, Books of. Two books of the Old Testament which formed only one book in the Hebrew canon, in which it is placed last. Its division into two parts is the work of the Seventy. (*See* SEPTUAGINT.) The Hebrew name means "event of the days," and is thus much the same as our "journals." The title given to it by the Seventy was *Paraleipomena*, meaning "things omitted." The name *Chronicles* was given to it by Jerome. The book is one of the latest compositions of the Old Testament, and is supposed to have been written by the same hand as Ezra and Nehemiah.

According to its contents, the book forms three great parts: (1) genealogical tables; (2) the history of the reigns of David and Solomon; (3) the history of the kingdom of Judah from the separation under Rehoboam to the Babylonian captivity, with a notice in the last two verses of the permission granted by Cyrus to the exiles to return home and rebuild their temple. The Chronicles present many points of contact with the earlier scriptures, historical and prophetical, more especially however, with the books of Samuel and of Kings.—Cf. articles in Cheyne's *Encyclopœdia Biblica*; Hastings's *Dictionary of the Bible*; and *Jewish Encyclopœdia*.

CHRON'OGRAM. A device by which a date is given in numeral letters by selecting certain letters of an inscription and printing them larger than the others, as in the motto of a medal struck by Gustavus Adolphus in 1632: "ChrIstVs DVX; ergo trIVMphVs"; where the values of C and the other capitals regarded as Roman numerals give the required figure when added together.

CHRON'OGRAPH. The name given to various devices for measuring and registering very minute portions of time with extreme precision. Benson's chronograph is, in principle, a lever watch with two second hands, one underneath the other. The outer end of the lower hand has a small cup filled with a black viscid fluid, with a minute hole at the bottom, while the corresponding end of the upper is bent down so as just to reach the hole. At the starting (say) of a horse-race, the observer pulls a string, whereupon the bent end of the upper hand passes through the hole and makes a black mark on the dial, instantly rebounding. Again, as each horse passes the winning-post the string is redrawn and a dot made, and thus the time occupied by each horse is noted.

The astronomical chronograph is operated electrically by a clock pendulum, making a mark on a sheet of paper at the end of each swing. By touching a spring when a star is observed to cross each wire in the field of a telescope, additional dots are made, thus recording, with extreme accuracy, the time of the star's crossings. A more recent form of chronograph almost entirely eliminates personal equation. A wire is made to move with the same apparent velocity as the star in the field of view, the observer having only to ensure, by a very slight manipulation of a screw, that the star continues exactly bisected by the wire throughout its passage across the field.—BIBLIOGRAPHY: F. Bashforth, *Experiments made with the Bashforth Chronograph*; Mach, *Collected Papers on Chronographs*.

CHRONOL'OGY (Gr. *chronos*, time, and *logos*, discourse). The science which treats of time, and has for its object the arrangement and exhibition of historical events in order of time and the ascertaining of the intervals between them. Its basis is necessarily the method of measuring or computing time by regular divisions or periods, according to the revolutions of the earth or moon. The motions of these bodies produce the natural division of time into years, months, and days.

As there can be no exact computation of time or placing of events without a fixed point from which to start, dates are fixed from an arbitrary point or *epoch*, which forms the beginning of an *era*. The more important of these are the creation of the world among the Jews; the birth of Christ among Christians; the Olympiads among the Greeks; the building of Rome among the Romans; the Hejira or flight of Mohammed among the Mohammedans; etc.

As this method, however, is applicable only to the historic period, it became necessary to devise some other means of computing time, so as to obtain some knowledge of what took place on the globe prior to the later stages of human civilization. This new departure of chronological research is founded on the science of geology. This method, however,

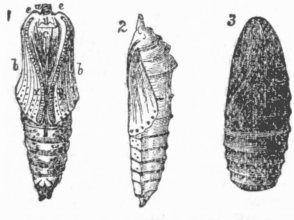
deals only with the sequence of events, and its results may be termed *relative*, in contradistinction to *absolute* or *mathematical* chronology. —BIBLIOGRAPHY: Sir H. Nicolas, *The Chronology of History*; Woodward and Cates, *Encyclopædia of Chronology*; Arbuthnot, *The Mysteries of Chronology*.

CHRONOM'ETER. Any instrument that measures time; specifically, those time-keepers which furnish Greenwich time for determining the longitude at sea. The chronometer has a special form of escapement, so constructed that the balance is disconnected from the train during the greater part of its vibration, and there is a compensation adjustment for temperature. The chronometer generally beats half-seconds, and is hung in gimbals in a box 6 or 8 inches square, to keep it horizontal during the rolling of the ship. An observation of the sun or a star enables the navigator to find his local time. The chronometer, allowance being made for its error on Greenwich time as noted at some previous date, and for its known daily rate, gives him the Greenwich time at the same instant. The difference, reckoned at 15° to the hour, indicates the longitude east or west of Greenwich.—BIBLIOGRAPHY: J. W. Benson, *Time and Time-tellers*; G. Lecointe, *Études des Chronomètres*.

CHRON'OSCOPE. An instrument for measuring the duration of extremely short-lived phenomena, such as the electric spark; more especially the name given to instruments of various forms for measuring the velocity of projectiles.

CHRUDIM (*hrö'dim*). A town, Bohemia, Czechoslovakia, 62 miles S.E. of Prague, with some manufactures and large horse-markets. Pop. 13,550.

CHRYS'ALIS. A form which butterflies and moths assume when they change from the state of larva or caterpillar and before they arrive at their winged or perfect state. In the chrysalis form the animal is in a state of rest or insensibility, and exists without nutriment, the length of time varying with the species and season. During this period an elaboration is going on in the interior of the chrysalis, giving to the organs of the future animal their proper development.



1, 2, Chrysalis of the White Butterfly-moth. *a*, Palpi or feelers; *b b*, Wing-cases; *c*, Sucker; *e e*, Eyes; *x x*, Antennæ. 3, Chrysalis of the Oak-eggar moth.

CHRYSAN'THEMUM. A large genus of Composite plants, consisting

Chrysanthemum

of herbs or shrubs with single, large-stalked yellow flowers or with many small flowers; the rays are sometimes white. Two species are common weeds in Britain, *C. Leucanthèmum* (the ox-eye daisy), a meadow plant with white ray-flowers, and *C. segètum* (the corn-marigold), a cornfield weed with golden-yellow ray-flowers. The chrysanthemum of

gardens is a Chinese half-shrubby plant (*C. sinense*), whose numerous varieties constitute one of the chief ornaments of gardens in the months of October, November, and December. It was first introduced into Great Britain in 1790, and the first chrysanthemum exhibition was held in 1825.

CHRYSELEPHAN'TINE (Gr. *chrysos*, gold, *elephas*, ivory). Made of gold and ivory combined, a term applied to statues executed in these two substances by the ancient Greeks, as Pheidias's great statue of Athena in the Parthenon, and the statue of Hera at Argos, by Polyclitus.

CHRYSIP'PUS. An ancient Greek philosopher belonging to Cilicia, lived about 282-209 B.C. He was one of the founders of the Stoic school, and its dialectician in chief; but he considered ethics to be the supreme and all-important science, whilst logic and physics were only subsidiary. He was the principal opponent of the Epicureans, and is said to have written more than 700 different works, mostly of a dialectical character; but only fragments are extant.

CHRYS'OBERYL (sometimes called **cymophane**, and, by the jewellers, **Oriental chrysolite**). A gem, of a pale yellowish-green colour, found in Brazil in round water-worn pieces about the size of a pea, but also crystallized in orthorhombic prisms. It is an aluminate of beryllium, is next to the sapphire in hardness, and is employed in jewellery, the specimens which present an opalescent play of light being especially admired. The variety *alexandrite*, from the Urals, is emerald-green, and red by transmitted light.

CHRYSOCOLLA. A green hydrous silicate of copper, rather more blue in tint and more porcellaneous in aspect than the common green carbonate malachite. It is an important though low-grade ore, and occurs in Chile and many mining areas.

CHRYS'OLITE. The most transparent form of *olivine* (q.v.), prized as a gem, and usually yellowish-green. Its hardness is scarcely below that of quartz.

CHRYSOLO'RAS, Manuel. A distinguished Greek of Constantinople, born about the middle of the fourteenth century, died 1415. He settled as a teacher of Greek literature at Florence about 1395. He also taught at Milan, Pavia, and Rome, thus becoming a chief promoter of the great revival of learning. His most important work was his *Greek Grammar* (Erotemata), published in 1484.

CHRYSOPHAN'IC ACID. A yellow substance obtained from plants, especially *Andira araroba* (*see* ANDIRA); used as an ointment in psoriasis and other skin diseases.

CHRYS'OPRASE. *See* CHALCEDONY.

CHRYS'OSTOM, John, St. ("golden-mouthed"). A celebrated Greek Father of the Church, born in Antioch about A.D. 344, died at Comana, in Pontus, 407. Secundus, his father, who had the command of the imperial troops in Syria, died soon after the birth of his son, whose early education devolved upon Anthusa, his mother.

Chrysostom studied eloquence with Libanius, the most famous orator of his time, and soon excelled his master. After having studied philosophy with Andragathius, he devoted himself to the Holy Scriptures, and determined upon quitting the world and consecrating his life to God in the deserts of Syria. He spent several years in solitary retirement, studying and meditating with a view to the Church. Having completed his voluntary probation, he returned to Antioch in 381, when he was appointed deacon by the Bishop of Antioch, and in 386 consecrated priest. He was chosen vicar by the same dignitary, and commissioned to preach the Word of God to the people. He became so celebrated for the eloquence of his preaching that the Emperor Arcadius determined, in 397, to place him in the archiepiscopal see of Constantinople.

He now exerted himself so zealously in repressing heresy, paganism, and immorality, and in enforcing the obligations of monachism, that he raised up many enemies, and Theophilus, patriarch of Alexandria, aided and encouraged by the Empress Eudoxia, caused him to be deposed at a synod held at Chalcedon. The emperor banished him from Constantinople, and Chrysostom purposed retiring to Bithynia; but the people threatened a revolt. In the following night an earthquake gave general alarm. In this dilemma Arcadius recalled his orders, and Eudoxia herself invited Chrysostom to return. The people accompanied him triumphantly to the city, his enemies fled, and peace was restored, but only for a short time. A feast given by the empress on the consecration of a statue, and accompanied by many heathen ceremonies, roused the zeal of the archbishop, who publicly exclaimed against it. Eudoxia, violently incensed, recalled

the prelates devoted to her will, and Chrysostom was condemned and exiled to Armenia.

Here he continued to exert his pious zeal until the emperor ordered him to be conveyed to a town on the most distant shore of the Black Sea. The officers who had him in charge obliged the old man to perform his journey on foot, and he died at Comana, by the way. Here he was buried; but in 438 his body was conveyed solemnly to Constantinople, and there interred in the Church of the Apostles, in the sepulchre of the emperor. At a later period his remains were placed in the Vatican at Rome. The Greek Church celebrates his feast on the 13th of Nov., the Roman on the 27th of Jan.

His works, which consist of sermons, commentaries, and treatises, among which the principal are *On Priesthood* and *On the Statues*, abound with information as to the manners and characteristics of his age. The most complete edition of his works (Greek and Latin) is that by Montfaucon (13 vols., 1718-38, and 1834-40). An earlier edition is that of Sir Henry Savile, issued in 1613.—Cf. *Lives* of Chrysostom by W. R. W. Stephens, R. W. Bush, and Rev. F. H. Chase (Bishop of Ely).

CHRYSOTILE. The crystallized form of the mineral *serpentine* (q.v.), occurring in delicate greenish or golden fibres, often set perpendicularly to the surfaces of cracks in massive serpentine, and used for the same purposes as asbestos.

CHUB (*Leuciscus cephalus*). A river-fish found in most English streams, and ranging through the greater part of Europe to Asia Minor and Persia. The body is oblong, nearly round; the head and back green, the sides silvery, and the belly white. It frequents deep holes in rivers shaded by trees, but in warm weather floats near the surface, and furnishes sport for anglers. It is indifferent food, and rarely attains the weight of 5 lb.

CHUBB, Thomas. English writer, born in 1679, died in 1746. Although engaged as a glover and chandler, he gave his chief attention to philosophical and theological study, and was celebrated in the Arian controversy for his argumentative keenness. In this connection he published in 1715 *The Supremacy of the Father Asserted*, besides various other moral and theological tracts.

CHUBB-LOCK. *See* LOCK.

CHUBUT. A territory and river of Patagonia, in Argentina. The territory is mostly arid, and ranching is the chief industry. Wheat and alfalfa are now grown, and oil wells are being developed. Gold, salt, and granite are mined. The capital is Rawson, near the coast. Area, 93,427 sq. miles; pop. 28,813. The river rises in the Andes and enters the Atlantic below Rawson. Length, 500 miles, mostly navigable.

CHUCK - WILL'S - WIDOW. A popular name in the United States for a bird of the goat-sucker family, *Antrostomus carolinensis*, so called from its cry.

CHUM'BUL. A river of N.W. India, which rises in the Vindhya Mountains, and falls into the Jumna about 90 miles S.E. of Agra, after a course of 650 miles.

CHUNAM'. In the East Indies a name given to a very fine kind of quicklime made from calcined shells or from very pure limestone, and used for chewing with betel and for plaster.

CHUNAR (chu-năr'), or **CHANAR.** A town and fortress, India, United Provinces, 26 miles S.W. of Benares, on the Ganges. The fortress stands on a lofty rock rising abruptly from the river. Pop. 9926.

CHUNCHUSES (chun'chō-zes). In Northern China, Manchuria, and adjacent regions, outlaws, fugitives from justice, vagabonds, and desperadoes of all kinds, who band themselves together and support themselves by robbery and plunder. In the war between Russia and Japan they appear to have given a good deal of trouble to the Russians.

CHUNGKING. One of the open ports of China, on the upper course of the Yangtze Kiang, an important centre of trade, both in native and foreign goods, though, owing to the nature of the river channel, steamers that can ascend to Ichang cannot reach Chungking, the trade being carried on by native craft on this portion of the Yangtze Kiang. Pop. 635,000.

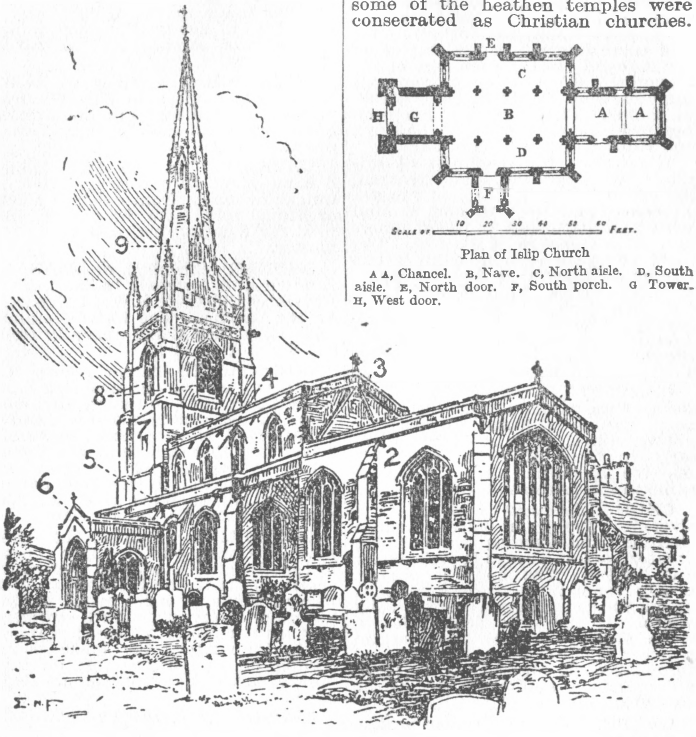
CHUPRAH, or **CHAPRA** (chup-rä'). A town of Patna division, Bengal, India, on the Gogra, about a mile above its confluence with the Ganges; extending along the river for nearly 4 miles, with an active trade in cotton, sugar, and saltpetre. Pop. 42,473.

CHUQUISACA (chō-kē-sä'kä), or **SUCRE.** A city of South America, the capital of Bolivia; well situated on a plateau between the Amazon and La Plata Rivers, 9343 feet above sea level. It has a cathedral and a university. It was founded by one of Pizarro's officers in 1539. Pop.

estimated at 34,000.—The province of Chuquisaca has an area of 36,132 sq. miles; pop. 333,226.

CHUR (*hör*). The capital of the Swiss canton of Grisons. *See* COIRE.

CHURCH (from Gr. *kyriakon*, from *kyrios*, "lord," i.e. the Lord's house, a term which from the third



Church, Islip, Northamptonshire

1, Eastern end and great east window. 2, Chancel and its windows. 3, End of nave. 4, Clerestory and its windows. 5, South aisle. 6, South porch. 7, Tower. 8, Belfry windows. 9, Spire.

Plan of Islip Church

A A, Chancel. B, Nave. C, North aisle. D, South aisle. E, North door. F, South porch. G Tower. H, West door.

remainder, as the Roman Catholic Church, the Protestant Church, etc.; or to designate the recognized leading Church of a nation, as the English, Scottish, or French Church.

In yet another sense it signifies the building specially devoted to Christian worship. After the conversion of Constantine, the basilicas or public halls and courts of judicature and some of the heathen temples were consecrated as Christian churches.

century was used, as well as *ecclesia*, to signify a Christian place of worship). A word which in its widest sense denotes, in the Teutonic languages, the whole community of Christians, thus rendering the term *ecclesia* used by the New Testament writers. In more restricted significations it denotes a particular section of the Christian community differing in doctrinal matters from the re-

When churches came to be specially built for Christian worship, their forms were various—round, octagonal etc. Later on the form with the cross aisle or transept (*cruciform* churches) became common. Early British churches were built of wood; the first stone churches erected being that of Whithorn, Galloway (sixth century), and that of York (seventh century).

Generally speaking, any building set apart for religious ordinances is called a church, though when of a minor kind it is usually designated a *chapel*. The term church, however, is often restricted to the buildings for worship connected with a national establishment. They are classed as *cathedral*, when containing a bishop's throne; *collegiate*, when served by a dean and chapter; *conventual* or *minster*, when connected with a convent or monastery; *abbey* or *priory*, when under an abbot or prior; and *parochial*, when the charge of a secular priest.—Cf. C. E. Norton, *Church Building in the Middle Ages*.

CHURCH. An urban district of England, in Lancashire, on the west of Accrington, of which it forms practically a suburb. Pop. (1931), 6185.

CHURCH, States of the. *See* PAPAL STATES.

CHURCH ARMY. An institution in connection with the Church of England, instituted by the Rev. Wilson Carlile in 1882, and essentially a working men's and women's mission to the lowest classes of the people, especially the degraded, the destitute, and the outcast. The headquarters are in London, and there are branches throughout the country, as well as in British colonies and the United States. Working men and women are specially trained for evangelistic work among the masses, many women being also trained as nurses.

Among institutions connected with the Army are labour homes, lodging homes, rescue homes for women, missions to prisons, workhouses, and reformatories; travelling missions and colportage vans; missions to harvesters, hop-pickers, etc.; dispensaries, cheap food depots, boys' homes, girls' homes, first offenders' homes, inebriate homes, etc. All workers for the Army carry on their work under the supervision of the incumbent of the parish in which their work lies. In dealing with the destitute and fallen, one great object is to enable them to raise themselves, and they must show themselves amenable to discipline, ready to work, and willing to reform.

CHURCHILL, Charles. English poet and satirist, was born in 1731, and died in 1764. He was educated at Westminster School, but did not have a university education, owing, perhaps, to an early and imprudent marriage. Being admitted to holy orders, he became curate to his father, and on the latter's death he obtained his curacy of St. John's, Westminster; but owing to his love of gaiety he was soon overwhelmed with debt, and had to compound with his creditors.

In 1761 he published anonymously a poem called *The Rosciad*, a clever satire on the chief actors of the day. Its success was increased by the vehemence with which the players replied to it, and Churchill seized the opportunity of giving the town a new satire, *The Apology*. A course of dissipation and intemperance followed, and, throwing aside all regard for his profession, Churchill became a complete man about town and a professional satirist. His other productions include: *The Ghost*, in which Dr. Johnson is satirized; *The Prophecy of Famine*, directed against the Scots; an *Epistle to Hogarth*; *The Conference*; *The Duellist*; *The Candidate*; and *The Journey*.

CHURCHILL, Lord Randolph. Second son of the seventh Duke of Marlborough, born 1849. Having entered Parliament in 1874, by 1884 he had risen to the position of a recognized leader of the Conservative party, and in 1885 became Indian Secretary in Lord Salisbury's Government. On the defeat of Gladstone's Irish Bill in 1886, Churchill became leader of the House of Commons and Chancellor of the Exchequer, posts which he unexpectedly resigned in Dec., 1886. He died in 1895. His biography has been written by his son Winston.

CHURCHILL, Rt. Hon. Winston Leonard Spencer. Son of the above, was born in 1874, and educated at Harrow and Sandhurst. He entered the army in 1895, and served with the Spanish forces in Cuba, the Malakand Field Force, the Tirah Expeditionary Force, and the Nile Expeditionary Force. In the South African War he was correspondent to *The Morning Post*. He entered Parliament as a Conservative in 1900, and, becoming a Liberal, sat for North-West Manchester 1906-8, Dundee 1908-22, and since 1924 for Epping Division of Essex.

He has in his time played many parts, having been Under-Secretary for the Colonies, 1906-8; President of Board of Trade, 1908-10; Home Secretary, 1910-11; First Lord of the Admiralty, 1911-15; Chancellor of the Duchy of Lancaster, 1915; Minister of Munitions, 1917; Secretary of State for War and Air, 1919-21; and Secretary of State for the Colonies, 1921; Chancellor of the Exchequer, 1924-29. In 1930, Churchill, as his views on India differed from those of the other Unionist leaders, took up an independent position in Parliament. His publications include: *Lord Randolph*

Churchill (1906), *My African Journey* (1908), and *The World Crisis* (1923-29), a one-volume edition of which was published in 1931. In 1930 he issued *My Early Life*.

CHURCHILL, Winston. American novelist. Born in St. Louis, 10th Nov., 1871, he was trained for the navy and given work on *The Army and Navy Journal*. Having edited *The Cosmopolitan Magazine*, he made a name in 1899 with a novel, *Richard Carvel*, which was followed by *The Crisis*, 1901; *The Crossing*, 1903; *Coniston*, 1906; *The Inside of the Cup*; and *The Dwelling Place of Light*.

CHURCHILL RIVER. A river of Canada, which rises in the province of Saskatchewan, in a region of lakes, forms or passes through various lakes or lake-like expansions, and enters Hudson Bay after a north-easterly course of about 800 miles.

CHURCHING OF WOMEN. A public thanksgiving after child-birth in the Roman Catholic and Anglican Churches, the latter having a special service in the Prayer Book. It is a custom dating from the early Mosaic ages (cf. Lev. xii. 6).

CHURCH-RATE. In England, a rate raised by resolutions of a majority of the parishioners in vestry assembled, from the occupiers of land and houses within a parish, for the purpose of maintaining the church and its services. In 1868 an Act was passed abolishing compulsory church-rates, except such as, under the name of church-rates, were applicable to secular purposes. A body of trustees may now be appointed in each parish to receive contributions.

CHURCHWAR'DENS. Officers, generally two for each parish in England, who superintend the church, its property, and concerns. They are annually chosen by the minister and parishioners, according to the custom of each parish.

CHURCHYARD BEETLE. The *Blaps mortisăga*, a common British insect found in dark, damp, and dirty places; it is black, but does not shine much, and the tip of the elytra forms a short obtuse point.

CHURN. A vessel for preparing butter from cream or milk, in which cream is agitated to separate its buttery globules in a solid mass from the fluid portions. Churns are made of various forms: one of the best is barrel-shaped and revolved end-over-end. Others contain internal fittings (dashers) for setting up cross-currents, but these are difficult to clean. Among various churns we may mention the following: "The Diaphragm Churn," invented by Thomas Bradford of Manchester, and "Garbutt's Two-minute Churn."

Bradford's "Diaphragm" Churn

CHURUBUSCO (chu-ru-bus'kō). A village 6 miles S. of Mexico, the scene of a battle between the Mexicans under Santa Anna and the Americans under Scott, 20th Aug., 1847, in which the former were defeated.

CHU'SAN ISLANDS. A group of islands on the east coast of China, the largest in the archipelago having the name Chusan, and being about 21 miles long, and from 6 to 11 miles broad. Pop. about 250,000. Chief town, Ting-hae; pop. about 30,000. Rice and tea are the principal products. From its situation near the mouths of the Yang-tse-kiang, which river forms the great channel of communication with the capital of the Republic, Chusan is considered as the key of China, and was temporarily taken possession of by the British in 1840, 1841, and 1860. The sacred island of Po-tu, to the east of the above, is covered with Buddhist temples, monasteries, etc., and is entirely inhabited by priests.

CHUT'NEY, or CHUTNEE. In the East Indies a condiment compounded of sweets and acids. Ripe fruit (mangoes, raisins, etc.), spices, sour

herbs, acyenne, lemon-juice are the ordinary ingredients. They are pounded and boiled together, and then bottled for use.

CHYLE (kīl). In physiology, a white or milky fluid into which the food is transformed in the intestines by means of digestion. Chyle is found in the intestines after the food has been mixed with the bile and pancreatic juice. It is absorbed by the lacteal vessels, terminating in the inner surface of the small intestines, chiefly the jejunum, and thence passes by numerous converging streams into the main trunk of the absorbent system, called the thoracic duct, through which it is gradually poured into the blood of the left subclavian vein at a short distance before it enters the right side of the heart.

CHYME (kīm). Food after it has been digested in the stomach. In the stomach it forms a pulpy mass, which passes on into the small intestine, and, being acted on by the bile, pancreatic fluid, and intestinal juice, is separated into chyle and non-nutritious matters, which latter are carried off by the evacuations. *See* DIGESTION.

CHYTRIDINEÆ. A class of unicellular Fungi, comprising many curious and little-known forms, parasites mainly on Algæ, but also on higher plants. The most important is *Chrysophlyctis endobiotica*, the cause of a destructive disease of the potato, known as cauliflower, or wart, disease (also incorrectly as black scab), which first appeared in Britain in 1900, but has since spread to an alarming extent.

Infected tubers develop warty outgrowths, at first white, later brown or black, and the whole potato may ultimately be transformed into a useless and unsightly mass of tumours. To combat the disease it is necessary to destroy the diseased crop, to isolate the infected field, to avoid planting potatoes in infected soil for at least six years, and to grow those varieties of potato which have been found to be most resistant. This disease is one of those notifiable under the regulations of the Board of Agriculture.

CIBBER, Colley. A dramatic writer and actor, born in London 1671, died 1757. He took to the stage in 1689. His first dramatic effort, *Love's Last Shift*, appeared in 1695, and it was followed by *Woman's Wit*, *The Careless Husband*, and *The Nonjuror*. A court pension and the appointment of Poet Laureate drew upon him the rancour of the wits and poets of the day, including Pope. He is author of about twenty-five dramas, and the amusing *Apology for the Life of Colley Cibber*, which is also an important history of the stage during the reign of Queen Anne.

His son **Theophilus**, born in 1703, drowned in his passage to Ireland in 1757, was an actor and dramatic writer. He was much inferior to his father in capacity.

Susanna Maria, wife of Theophilus Cibber, born 1716, died 1766, was one of the best actresses on the English stage. She was sister of Dr. Arne (composer of *Rule, Britannia*), who taught her music, and introduced her in one of his operas at the Haymarket Theatre. Handel composed pieces expressly adapted to her voice, and used to instruct her in singing them. She subsequently made her appearance in tragedy, and gained universal admiration. Garrick is said to have exclaimed, when informed that she was dead, "Then tragedy has expired with her."—Cf. Lowe, *Bibliographical Account of English Theatrical Literature*.

CIB'OL (Allium fistulōsum). A perennial plant of the onion genus, a native of Siberia, with hollow stems larger than those of the chive: used for culinary purposes.

CIBO'RIUM. In the Roman Catholic Church a kind of cup or chalice made of gold or silver, and containing the bread used in the sacrament. The term was also applied in early Christian times to the canopy that surmounted and crowned the altar.

CICA'DA. The popular and generic name of certain insects belonging to the ord. Hemiptera, sub-ord. Homoptera, of many species. The males have on either side of the body a kind of drum, with which they can make a considerable noise. This, regarded as the insect's song, was much admired by the ancients, and is frequently referred to by their poets. The largest European species are about an inch long, but some American species are much larger, and can be heard a mile off. They are nearly all natives of tropical or warm temperate regions. The female has the posterior extremity of the abdomen furnished with two serrated horny plates, by means of which she pierces the branches of trees to deposit her eggs.

About 800 species are known, mostly tropical. An English species (*C. anglica*) is found in the New Forest. The seventeen years' locust (*Cicāda septemdecim*), well known in the United States, is so named on account of its prolonged life, which

is mostly spent as an underground larva.

CICERO, Marcus Tullius. The greatest Roman orator, was born 106 B.C. at Arpinum. His family was of equestrian rank, and his father, though living in retirement, was a friend of some of the chief public men. He received the best education available, studied philosophy and law, became familiar with Greek literature, and acquired some military knowledge from serving a campaign in the Marsic War. At the age of twenty-five he came forward as a

Cicero. From a cast of the bust at Madrid

pleader, and having undertaken the defence of Sextus Roscius, who was accused of parricide, procured his acquittal.

He visited Greece 79 B.C., conversed with the philosophers of all the schools, and profited by the instruction of the masters of oratory. Here he formed that close friendship with Atticus of which his letters furnish such interesting evidence. He also made a tour in Asia Minor and remained some time at Rhodes, where he visited the most distinguished orators and took part in their exercises. On his return to Rome his displays of eloquence proved the value of his Grecian instruction, and he became one of the most distinguished orators in the forum.

In 76 B.C. he was appointed quæstor of Sicily, and behaved with such justice that the Sicilians gratefully remembered him and requested that he would conduct their suit against their governor Verres. He appeared against this powerful robber, and the crimes of Verres were painted in the liveliest colours in his immortal speeches. Seven of the Verrine orations are preserved, but only two of them were delivered, and Verres went into voluntary exile. After this suit Cicero was elected to the office of ædile, 70 B.C., became prætor in 67, and consul in 63. It was now that he succeeded in defeating the conspiracy of Catiline (*see* CATILINE), after whose fall he received greater honours than had ever before been bestowed upon a Roman citizen. He was hailed as the saviour of the state and the father of his country (*parens patriæ*), and thanksgivings in his name were voted to the gods.

But Cicero's fortune had now reached the culminating point, and soon was to decline. The Catilinarian conspirators who had been executed had not been sentenced according to law, and Cicero, as chief magistrate, was responsible for the irregularity. Publius Clodius, the tribune of the people, raised such a storm against him that he was obliged to go into exile (58 B.C.). On the fall of the Clodian faction he was recalled to Rome, but he never succeeded in regaining the influence he had once possessed.

In 52 B.C. he became proconsul of Cilicia, a province which he administered with eminent success. As soon as his term of office had expired he returned to Rome (Jan., 49 B.C.), which was threatened with serious disturbances owing to the rupture between Cæsar and Pompey. He espoused the cause of Pompey, but after the battle of Pharsalia he made his peace with Cæsar, with whom he continued to all appearance friendly, and by whom he was kindly treated, until the assassination of the latter (44 B.C.).

He now hoped to regain his political influence. The conspirators shared with him the honour of an enterprise in which no part had been assigned him; and the less he had contributed to it himself the more anxious was he to justify the deed and pursue the advantages which it offered. Antony having taken Cæsar's place, Cicero composed those admirable orations against him, delivered in 43 B.C., which are known to us by the name of *Philippics* (after the speeches of Demosthenes against

Philip of Macedon). His implacable enmity towards Antony induced him to favour young Octavianus, who professed to entertain the most friendly feelings towards him. Octavianus, however, having possessed himself of the consulate, and formed an alliance with Antony and Lepidus, was unable to prevent Cicero being proscribed. In endeavouring to escape from Tusculum, where he was living when the news of the proscription arrived, he was overtaken and murdered by a party of soldiers; and his head and hands were publicly exhibited in the forum at Rome. He died in his sixty-fourth year, 43 B.C.

Cicero's eloquence has always remained a model. After the Revival of Learning he was the most admired of the ancient writers; and the purity and elegance of his style will always place him in the first rank of Roman classics. His works, which are very numerous, consist of orations; philosophical, rhetorical, and moral treatises; and letters to Atticus and other friends. The life of Cicero was written by Plutarch, and there are modern lives by Middleton, Forsyth, Strachan-Davidson (Heroes of the Nations), and others.

Cicero left a son of the same name by his wife Terentia. Young Marcus was born in 65 B.C., was carefully educated, and distinguished himself in military service. In 30 B.C. Octavianus (Augustus) assumed him as his colleague in the consulship, and he was afterwards Governor of Asia or Syria.—Cicero had also a daughter, Tullia, who to his great grief died in 45 B.C.—Cicero's younger brother, Quintus, was a man of some note both as a public character and as a writer. He was married to a sister of Atticus, and was put to death at the same time as the orator.

—BIBLIOGRAPHY: J. L. Strachan-Davidson, *Life of Cicero*; G. Boissier, *Cicéron et ses amis*; E. G. Sihler, *Cicero of Arpinum*.

CICINDE'LA. A genus of insects to which *C. campestris*, the tiger-beetle of Britain, belongs.

CICO'NIA. The genus of birds to which the stork belongs.

CICU'TA. A genus of umbelliferous plants, including *C. virôsa*, water-hemlock or cowbane. *See* HEMLOCK.

CID, or CID CAMPEADOR. An epithet (from the Ar. *seid*, a lord, a chief, a commander) applied to Ruy or Roderigo Diaz, Count of Bivar, the national hero of Spain (born 1040, died 1099). His remains were transferred to the crypt of the Cathedral at Burgos (Sept., 1921), where they now rest. He signalized himself by his exploits in the reigns of Ferdinand, Sancho, and Alphonso VI. of Leon and Castile; but the facts of his career have been so mixed with glorifying myths that it is scarcely possible to separate them. His life, however, appears to have been entirely spent in fierce warfare with the Moors, then masters of a great part of Spain.

His exploits are set forth in a special chronicle, and in a Castilian poem of a little over 3700 lines, probably composed about the middle of the twelfth century. The story of his love for Ximena is the subject of *Le Cid* of Corneille. Whatever chronicles and songs have conveyed to us of the history of the Cid is collected in Southey's *Chronicle of the Cid*. The exploits of the Cid have furnished material for many dramatic writers, notably Guillen de Castro, whose work *Las Mocedades del Cid* formed the basis for Corneille's tragedy *Le Cid*.—Cf. H. Butler Clark, *The Cid Campador*.

CI'DER. A fermented liquor made from the expressed juice of apples. The apples are ground and crushed until they are reduced to a pulp, the juice is allowed to run into casks, where it is freely exposed to the air until fermentation takes place, when a clear liquor of a pale-brown or amber colour is the result. Worcester, Hereford, Gloucester, and Devon are the great cider-producing counties of England. The industry has also been revived with success in the north of Ireland. In France, Germany, and other countries, and particularly in North America, it is also largely made. It contains 5 to 10 per cent. of sugar, and from 2 to 7 per cent. of alcohol, and is intoxicating if drunk in quantities.

CIENFUEGOS (thĕ-en-fō-ā'gōs). A seaport of Cuba, on the south coast of the island, with a safe and capacious harbour on the Bay of Jagua, 130 miles S.E. of Havana, with which (and other towns) it is connected by railway. It is among the finest towns of the island, and exports sugar, wax, and timber. Pop. 39,946.

CIEZA (thĕ-ā'thâ). A town, Spain, in the province and 24 miles N.W. of Murcia, on an eminence near the right bank of the Segura. Pop. 13,740.

CIGAR (si-gär'). A small roll of manufactured tobacco-leaves carefully made up, and intended to be smoked by lighting at one end and drawing the smoke through it. The choicest cigars are those made in and

imported from Havana. British cigars are largely made in imitation of the foreign brands, but they have never equalled the latter in quality. Good cigars are also made in the United States and elsewhere. Medicated cigars, or cigars made of some substance having remedial properties, are often used for certain complaints, as stramonium cigars for asthma. *Cheroots* are cigars which are truncated at both ends, and are largely imported from Manila.

CIGARETTE (sig-a-ret'). A sort of small cigar made by rolling fine-cut tobacco in thin paper, but sometimes also in tobacco-leaf or the husk of Indian corn.

CIGNANI (chē-nyä'nē), **Carlo.** Italian painter, born at Bologna in 1628, died 1719, the most distinguished of three Bolognese painters of the same name. His finest paintings are frescoes in the saloon of the Farnese Palace, Bologna, and in the cupola of the church of the Madonna del Fuoco at Forli (*Assumption of the Virgin*). His paintings have been engraved by various artists.

CIGOLI (chē'go-lē), **Ludovico Cardi da.** *See* CARDI.

CIL'IA (Lat. eyelashes). Microscopic threads of living substance, averaging $\frac{1}{4000}$ inch in length, found on the surface of the tissues of most animals, and in some vegetable organisms (as Volvox), chiefly on tissues which are in contact with water, or which produce fluid secretions. They are constantly in a state of active movement, and communicate to the fluid with which they are in contact a corresponding motion. This is called *vibratile* or *ciliary motion*. In most of the lower aquatic animals the respiratory function is aided by means of the vibratile cilia; many animalcules move by a similar mechanism; and in the highest classes of animals cilia have a share in the performance of some important functions.

CILIC'IA. In ancient geography, the region between Pamphylia and Syria, lying south of Mount Taurus. Alexander made Cilicia a Macedonian province; it then passed to the Syrians. Under Augustus it became an imperial province. It is now in the vilayet of Adana, and was occupied by French troops after the European War. Encounters took place in 1920 between the French troops and the Turks.

CIMABUE (chē-mä-bō'ā), **Giovanni,** properly named **Gualtieri.** Italian painter, born at Florence in 1240, died probably in 1302. According to Vasari, two Greek artists, who were invited to Florence to paint a chapel in the church of Santa Maria Novella, were his first masters. He is considered one of the chief Italian restorers of the art of painting, which at that time had degenerated into mechanical conventionalism. His best paintings are in the church of Santa Maria Novella at Florence, and in the Sacro Convento at Assisi. The famous *Madonna of Santa Maria Novella*, called the "Madonna Ruccellai," and long attributed to Cimabue, is the work of Duccio di Buoninsegna of Siena. Among his pupils was Giotto, whom he discovered drawing figures on the smooth surface of a rock while tending his sheep.—Cf. Crowe and Cavalcaselle, *History of Painting in Italy*.

CIMAROSA (chē-mä-rō'sä), **Domenico.** A composer, born at Naples in 1749, died at Venice 1801. He composed about 120 operas, mostly of a light nature. His best-known work is *Il Matrimonio Segreto* (The Secret Marriage). Other operas by him are: *Le Stravaganze del Conte L'Italiana in Londra, Il Matrimonio, Artaserse.*

CIMBRI (sim'brī). A tribe of ancient Europe, the origin of which is involved in obscurity. They were regarded as Germans by the Romans, who gave the name Chersonesus Cimbrica to what is now Jutland. Greek writers connected them with the Scythian Cimmerii of the Crimea; while modern writers suppose that they were Celtic, and that Cimbri is the same as the Cymri of Britain. In the second century B.C. they made formidable incursions into Gaul and Spain, but were finally routed by the Consul Marius at Vercelli, 101 B.C. (battle of the Raudine Plain).

CIMME'RIANS. An ancient nomadic tribe who occupied the Tauric Chersonese (Crimea) and Asiatic Sarmatia (the country of the Lower Volga). They are said, in pre-Homeric times, to have ravaged Asia Minor, and in a second invasion to have penetrated to Æolis and Ionia, and to have held possession of Sardis. A mythical people mentioned in the *Odyssey*, xi. 12-19, as dwelling beyond the ocean-stream in the thickest gloom were also termed Cimmerii, a fable which gave rise to the phrase "Cimmerian darkness."

CIMO'LIAN EARTH, or **CIM'OLITE.** A hydrated silicate of aluminium found in the Island of Cimolos, the modern Argentiera, one of the Cyclades. It is used for the same purposes as fuller's earth. In ancient times it was also used as a soap and as a detergent medicine.—Cf. Aristophanes, *Frogs*, 713.

CI'MON. An ancient Athenian general and statesman (born about 507 B.C.), was a son of the great Miltiades and Hegesipyle, daughter of a Thracian king. He fought against the Persians in the battle of Salamis (480 B.C.), and shared with Aristides the chief command of the fleet sent to Asia to deliver the Greek colonies from the Persian yoke. The return of Aristides to Athens soon after left Cimon at the head of the whole naval force of Greece.

He distinguished himself by his achievements in Thrace, having defeated the Persians by the Strymon, and made himself master of the country. He conquered the pirate-island of Scyros, subdued all the cities on the coast of Asia Minor, pursued the Persian fleet up the Eurymedon, destroyed more than 200 of their ships, and then, having landed, on the same day entirely defeated their army (469 B.C.). He employed the spoil which he had taken in the embellishment of Athens, and in 463 reduced the revolted Thasians; but the popular leaders, beginning to fear his power, charged him on his return with having been corrupted by the King of Macedon. The charge was dropped, but when Cimon's policy of friendship to the Lacedæmonians ended in the latter insulting the troops sent by Athens to their aid, his opponents secured his banishment.

He retired into Bœotia, and his request to be allowed to fight with the Athenians against the Lacedæmonians in 457 at Tanagra was refused by the suspicious generals. Eventually Cimon was recalled, at the instance of Pericles, to conclude a peace with Lacedæmon. He died shortly after, in 449, while besieging Citium in Cyprus.

CINCHONA (sin-kō'na or sin-chō'na; the name is from the Countess of Chinchon, wife of a viceroy of Peru, a lady who was cured of fever by the bark in 1638). An important genus of Rubiaceæ, consisting of trees seldom exceeding 40 or 50 feet in height, with simple, opposite, entire leaves and small flowers, inhabiting chiefly the east side of the Andes of Peru, Bolivia, Ecuador, and Colombia.

The valuable Peruvian bark is yielded by various species; crown or loxa bark by *C. Condaminea*, red bark by *C. succirubra*, yellow bark by *C. Calisaya*, and *C. Ledgeriana*, the richest in alkaloids. From the wasteful method of cutting down the trees to get their bark, it was believed that there would soon be a dearth of the valuable medicine, and hence cinchona plants were taken from their native regions and plantations formed in various tropical countries, so that Ceylon, India, Java, etc., are now important sources of Peruvian bark. The bark is taken off in strips longitudinally, and is in time renewed by natural growth. *See* QUININE.

CINCHONINE. A vegetable alkaloid contained in all the varieties of Peruvian bark, but principally in *C. lancifolia*, or pale bark. Though less bitter than quinine, it may be substituted for it in larger quantities.

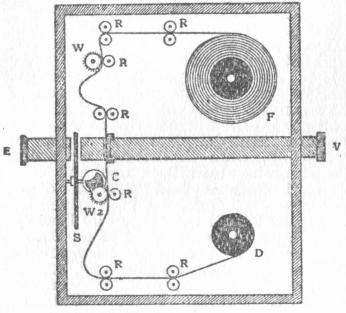
CINCINNATI (sin-sin-á'tē). "The Queen of the West," a city of the United States, in Hamilton County, Ohio, on the north bank of the River Ohio. It was first regularly laid out in 1789, and began to flourish after 1794. It stands partly in a valley, partly on hills, and has an area of 24 sq. miles; the central part is very compact, and a great number of the houses are handsomely built of freestone, blue limestone, or brick. Noteworthy buildings are the Cincinnati College and several other colleges. Cincinnati University (founded in 1874), the public library, chamber of commerce, United States Government building (law-courts, post office, etc.), new city hall, music-hall, art museum, masonic temple, etc. St. Peter's Roman Catholic Cathedral and St. Paul's (Episcopal) Church are among the finest churches in the city. There are two large parks and numerous recreation grounds.

Cincinnati is an important manufacturing place, the chief articles being railway materials, machinery, carriages, furniture, leather, boots and shoes, etc. In addition to the fine river, railways and canals stretch from it in every direction, connecting it with every port on the great lakes from Chicago to Niagara, and with Albany, Boston, New York, Philadelphia, and Baltimore. On the other side of the river are the cities of Covington, Newport, Dayton, and Ludlow. Pop. 451,160.

CINCINNA'TUS, Lucius Quinctius. A wealthy patrician in the early days of the Roman Republic, born about 519 B.C. After violently opposing the passage of the Terentilian law for the equalization at law of patricians and plebeians, he succeeded Publicola in the consulship, and then retired to cultivate his small estate beyond the Tiber. Here, when Minucius was surrounded by the Æquians, the messengers of the Senate found him at work, when they came to summon

him to the dictatorship. He rescued the army from its peril, marched to Rome laden with spoil, and then returned quietly to his farm. At the age of eighty he was again appointed dictator to oppose the ambitious designs of Spurius Mælius.

CINEMA'TOGRAPH. The more popular form of the word, which is more correctly *kinematograph*. This form of spelling is due to one of the first practical apparatus having been introduced from France, the French name being *cinématographe*. The origin of the English word *cinematograph* is apparent from a word



Section of Cinematograph Apparatus

such as *kinematics*, that branch of the science of mechanics which treats of motion. Both words are derived from the Greek word *kinema*, motion, while the last syllable of cinematograph is derived from the Greek word *grapho*, I write; so that this apparatus is a recorder of motion. There have been other names for this apparatus, such as *mutograph*, *biograph*, *animatograph*, etc.

Early Experiments.—There is no doubt that the cinematograph has been evolved from very simple apparatus of earlier generations. In 1825 there was invented a *thaumatrope* (Gr. *thauma*, a wonder, and *trepo*, I turn), which consisted of a circular piece of cardboard, on one side of which was a picture of an empty bird-cage, and on the other side a bird. When this piece of cardboard was turned rapidly upon its horizontal axis, by means of two pieces of string attached to its edges, there appeared to be one picture only, and this showed the bird standing on the perch in the bird-cage.

The explanation of the phenomenon is very simple, for it is apparent that two separate images are produced upon the retina of the eye, one following the other so rapidly that the impression of the one image has not disappeared before the other is superimposed upon it, and so we say that the phenomenon is due to the persistence of vision, which with a bright light may last as long as one-tenth part of a second. The persistence of vision was known to the ancients, it having been mentioned by Lucretius in *De Rerum Natura* in 65 B.C., and again by Ptolemy in A.D. 130. The phenomenon may be demonstrated in a simple manner by attaching a piece of red-hot stick to the end of a piece of string, and whirling this red-hot object around in the dark; there will be seen a complete circle of light, the different images of the stick in its various successive positions all persisting on the retina of the eye at the one time.

Nearly one hundred years ago there was invented, by a Belgian, a simple apparatus called a *phenakistoscope*, which consisted of a circular piece of cardboard, about 10 inches in diameter, upon the outer edge of which there were drawn ten or twelve pictures, in positions similar to the numerals on a clock dial, and each drawing represented the same figure in a different position. Each picture might represent the successive positions of, say, a man in the act of jumping. The object of the apparatus was to throw these different images upon the retina of the eye so rapidly that there would appear to be only one image making a complete succession of movements.

The method adopted was very simple. The cardboard disc was affixed to a larger disc, in which were cut as many slots as there were pictures, each slot being placed immediately above a picture, the slots forming a larger circle than the pictures. These discs were mounted upon a spindle at their common centre, and arranged so that this double disc could be revolved rapidly. The pictures were viewed in a mirror, the operator looking through each slot as it was brought in rapid succession in front of his eye. The successive images formed upon the eye produced the impression of a man in the act of jumping. There were many other forms of apparatus for producing the same phenomenon, and these were known under such names as the *praxinoscope*, the *zoopraxiscope*, *stroboscope*, *zoetrope*, etc.

Photographic Motion Pictures.—The introduction of photography in the production of such phenomena came

about in this way. In 1872 Eadweard Muybridge, an English resident in California, used a camera for taking photographs of a horse while trotting. He merely took individual photographs at different times and compared the positions of the legs. In 1878 Muybridge desired to record the successive movements of a horse while trotting, so he erected a row of twenty-four cameras along a platform having a white painted background. As the horse trotted along this platform the movements of the horse's legs operated an instantaneous shutter in the camera immediately opposite the horse, and in this way Muybridge recorded a complete cycle of movements of a trotting horse. Arranging transparent positives of these negatives in a large circle, he was able to pass them rapidly through a projecting lantern, so that he could reproduce the movements of the horse upon a lantern screen. He gave a demonstration of this at the Royal Institution in London in 1882. He used glass-plate positives and an electric lantern (see *Times*, 6th May, 1889). Muybridge died in 1904, leaving his apparatus to the Public Library of his native town, Kingston-on-Thames.

In 1882 M. Marey of Paris made an arrangement by which he could photograph, with a single camera, the successive motions of a subject, the movements of which were not sufficient to bring it in front of another camera, as, for instance, the actions of a man in jumping. Marey used a rotating shutter, and the different images were recorded on the one negative. The object of these experiments was entirely scientific, the desire being to study the motions of persons and animals.

The Continuous Film.—It will be understood that in Muybridge's experiments the figures were all in the centre of the plate, so that although the figure was seen in motion there was no appearance of progression. One of the first attempts at taking real moving pictures was made by W. Friese-Greene and M. Evans in 1889, and a lantern demonstration was given by them to the Bath Photographic Society in 1890. Theirs was the first apparatus in which a continuous film was used.

The description of their camera may be followed more easily by reference to the accompanying diagram, which shows the general principle of all cinematograph apparatus. The long film was carried on a feeding-spool or drum (F), and, after passing the point of exposure, it was rolled up on a receiving-spool, or drum (D), passing on its way through a number of pairs of rollers (R). The film in the modern apparatus is perforated near its edges, and sprocket-wheels (W) fit into these perforations, and thus drive the ribbon or film forward from the one drum to the other. The inertia of these heavy drums would be too great to allow of them being conveniently started and stopped in the small fraction of a second which can be devoted to the taking of each picture. This difficulty was overcome by allowing the two drums to revolve continuously at the required speed, and interposing a roller containing a spring between the point of exposure and the receiving-spool (W_2).

This roller was driven continuously from the main shaft, and the spring would have caused the roller to revolve continuously but for an escapement-tooth fixed on the edge of the roller and resting against a cam (C). This cam was constantly revolving, and arrested the motion of the roller, excepting when a gap in the cam permitted the escapement-tooth to pass; this happened once in every revolution, and thereupon the roller made one turn and drew down the exposed part of the film, bringing a fresh portion into position for exposure. While the film was stationary the receiving-spool rolled up the slack, and the feeding-spool reeled off a new length, ready to be carried down for the next exposure.

It will be observed that the sudden stopping and starting is applied only to this free loop of film, and that the heavy reels are in continuous rotation. The exposure-opening is closed by a revolving shutter while the forward motion takes place. This shutter (S) has a slot cut to give as long an exposure as possible, the aperture being closed only during the movements of the film in its forward march. In the accompanying diagram, E represents the exposure-opening, and V the cap on the end of a tube through which the film may be viewed through the instrument.

Edison's Invention. — In 1893 Edison invented a small apparatus called the *kinetoscope*, in which one person at a time viewed the moving film directly. The film moved at a steady pace, but the illumination was intermittent. A small electric glow-lamp was placed behind the film, and this light flashed as each picture was centred. The machine had to be driven at the high speed of forty-six pictures per second.

This apparatus did not come into general use, but Edison's camera formed the basis of all modern cinematograph apparatus. It was the Kodak photographic film on a long,

flexible, celluloid ribbon which made cinematography possible. The size of the picture is only 1¾ inches × ¾ inch, and a single reel may contain from 100 to 1500 feet of film, about 700 feet being required for a run of one-quarter hour, and about 5000 feet for a show of two hours.

Sound Pictures.—The problem of the synchronous reproduction of pictures and sounds attracted many inventors, and by 1929 the "talking pictures" had become an artistic and commercial success. In one form of record, the sounds are recorded on a disc similar to a gramophone disc, and the reproduction is correctly timed by electrical means. In another form, the sound record occupies a narrow strip on one side of the film, and is made by sounds affecting the luminosity of a special lamp to which the moving film is exposed through a slit. The sounds are reproduced by the converse process, loud-speaking telephones being actuated by a photoelectric cell (*see* description of a selenium cell under OPTOPHONE) which is subjected to the fluctuations of light passing through the developed film record.—BIBLIOGRAPHY: V. Steer, *The Romance of the Cinema*; B. E. Jones, *The Cinematograph*; F. A. Talbot, *Moving Pictures: how They are Made and Worked*; Mariani, *Guida pratica della Cinematografia* (Manuali Hœpli); H. V. Hopwood, *Living Pictures*.

CINERA'RIA. A genus of plants, nat. ord. Compositæ, consisting of herbs or small shrubs with small-sized heads of flowers. They are chiefly found in South Africa, but a number of varieties are much prized for garden purposes.

CIN'GULUM. The girdle with which the alb of a priest is gathered at the waist. The term is also applied to a band of dental substance surrounding the base of the crown of the tooth in some animals.

CINNA, Lucius Cornelius. An eminent Roman, an adherent of Marius, who, obtaining the consulship 87 B.C., along with Gneus Octavius, impeached Sulla and endeavoured to secure the recall of Marius. Being driven from the city by Octavius, he raised the Italian cities, and invested Rome while Marius blockaded it from the sea. On its capture the friends of Sulla were massacred, and Cinna and Marius made themselves consuls (86 B.C.); but after the death of Marius the army refused to follow Cinna against Sulla, and put him to death in 84 B.C.

CIN'NABAR. The principal ore of mercury, a handsome red mineral composed of mercury sulphide, occasionally including metallic mercury in its cavities. It has the high specific gravity of 9. The mines of Idria in Carniola, and Almaden in Spain, have been worked from Roman times. The pigment vermilion was in old times made from powdered cinnabar; but it is now mostly artificial.

CINNAMO'MUM. A genus of plants, nat. ord. Lauraceæ, natives of tropical Asia and the Polynesian Islands. All the species possess an aromatic volatile oil, and one of them yields true cinnamon, while others yield cassia and camphor.

CIN'NAMON. The bark of the under branches of a species of laurel

Cinnamon Plant. Section of bloom on right

(*Cinnamōmum zeylanicum*), which is chiefly found in Ceylon, but grows also in Malabar and other parts of the East Indies. The tree attains the height of 20 or 30 feet, has oval leaves, pale-yellow flowers, and acorn-shaped fruit. The Ceylonese bark their trees in April and November, the bark curling up into rolls or quills in the process of drying, the smaller quills being introduced into the larger ones. An oil of cinnamon is prepared in Ceylon, but the oil of cassia (from *C. Cassia*) is generally substituted for it; indeed, the cassia bark is often substituted for cinnamon, to which it has some resemblance, although in its qualities it is much weaker. *C. Camphora* is the source of Japan camphor.

CINNAMON-STONE (Essonite). A variety of Grossularite, the calcium-aluminium garnet, of a cinnamon, hyacinth-red, yellowish-brown, or honey-yellow colour; *hyacinth* includes yellow kinds and the cinnamon-coloured examples from Ceylon. It occurs usually in limestones altered by igneous masses such as granite.

CINO DA PISTOIA. An Italian jurisconsult and poet, born in 1270 at Pistoia. He was the friend of Petrarch and of Dante, and ranks amongst the best of the early Italian poets. Petrarch called him "Nostro Amoroso Messer Cino." His poems were first published at Rome in 1558.

CINQ-MARS (sank-märs), **Henri Coiffier de Ruzé, Marquis de.** Favourite of Louis XIII., born in 1620, and introduced at court by Cardinal Richelieu. The king made him Master of the Robes and Grand Equerry of France when only in his nineteenth year, and he soon aspired not only to a share in the management of public affairs, but even to the hand of the beautiful Maria di Gonzaga, Princess of Mantua, afterwards Queen of Poland. Thwarted, however, by the cardinal, Cinq-Mars concocted a plot with the Duke of Bouillon for the overthrow of Richelieu, and entered into treaty with Spain. To propitiate Richelieu the king was compelled to sacrifice his favourite, who was arrested at Narbonne, and beheaded with his friend the young councillor De Thou at Lyons in 1642. There is a novel *Cinq-Mars* by Alfred de Vigny.

CINQUE-CENTO (chēn'kwā-chen-tō; It., literally 500, but used as a contraction of 1500, the century in which the revival took place). A term employed in reference to the decorative art and architecture belonging to that attempt at purification of style and reversion to classical forms introduced soon after the beginning of the sixteenth century in Italy. The term is often loosely applied to ornament of the sixteenth century in general, properly included in the term *Renaissance*. Roughly speaking, it is the age from Leonardo da Vinci to Paolo Veronese.

CINQUE-FOIL (singk'foil). In architecture, an ornament in the Gothic style, consisting of five foliated divisions, often seen in circular windows.

CINQUEFOIL. The name of several plants of the genus Potentilla, especially *P. reptans*.

CINQUE PORTS (singk). Originally the five English Channel ports of Hastings, Romney, Hythe, Dover, and Sandwich, on the south-east coast of England, to which were added subsequently the towns of Winchelsea, Rye, and Seaford. They were granted special privileges by the later Saxon and earlier Norman kings, on condition of providing a certain number of ships during war, there being no permanent English navy previous to the reign of Henry VII. Each port returned two members to Parliament, but after the Reform Act of 1832 Hastings, Dover, and Sandwich alone retained this privilege, Rye and Hythe returning one each, and the remaining towns none. Sandwich was afterwards disfranchised for corruption, and by the Act of 1885 Hastings and Dover were each deprived of a member, and Rye ceased to be a borough.

By the Representation of the People Act (1918) Hastings and Hythe return one member each; while Dover and Rye give name to parliamentary divisions of Kent and East Sussex respectively. They are, collectively, in the jurisdiction of a lord warden, who receives £3000 a year for his sinecure.—Cf. F. M. Hueffer, *Cinque Ports*.

CIN'TRA. A town, Portugal, 15 miles W.N.W. of Lisbon, finely situated on the slope of the Sierra de Cintra, and much resorted to by the wealthier inhabitants of Lisbon. The former Kings of Portugal had a palace with fine gardens at Cintra. The town is celebrated for the convention entered into there in 1808, by which the French, after their defeat at Vimeira, were conveyed to France. Pop. 6000.

CIOTAT (si-ō-tä), **La.** A seaport, France, on the Mediterranean, 15 miles S.E. of Marseilles, surrounded by an old rampart, and having well-built houses and spacious streets. Shipbuilding is carried on and an extensive coasting trade. Pop 11,880.

CIPHER. Symbol O, nought or zero. The word has been applied to all forms of secret writing, also known as cryptography. Cipher writing was in use among the Romans. Cæsar's system, the simplest and commonest form, consisted merely of writing for each letter the letter which came three places after it in the alphabet, thus D for A.

Other systems include the writing of words backwards, the use of key words, and arbitrary symbols. Of the latter, Bright's *Characterie* (1588) was the first example, and modern shorthand systems are the latest development.

CIPPUS. In Roman antiquities, a low column generally rectangular,

and sculptured, and often bearing an inscription. They served as sepulchral monuments, as milestones and boundaries, and in some cases received the inscribed decrees of the Senate.

CIPRIANI (chē-prē-ä'nē), **Amilcare.** Italian politician and agitator, born at Rimini, 18th Oct., 1845, died in Paris, 2nd May, 1918. He grew up in the midst of Italy's suffering and struggle for independence, at a moment when the spirit of *Risorgimento* was animating his country. At the age of fourteen he entered upon his career of agitation and adventures, and for forty years remained the knight of liberty and the apostle of revolution.

In 1860 he joined Garibaldi in his expedition to Sicily, and then went to Greece, but was soon compelled to leave the country. He then came to London, where he met Mazzini, Karl Marx, and Engels, whom he helped to found the Internationale. In 1866 he raised 300 men, and again joined Garibaldi in his Venetian campaign. He then went to Crete to help in the struggle for liberty, and thence, in 1870, to Paris, where he took part in the Commune. Arrested, he was sent to the penal settlement in New Caledonia, where he remained till 1880.

On his return to Italy, he was sent to prison, and only released in 1888, when he at once went to Paris. Here he was once more condemned to six years' imprisonment for sedition. In 1897 Cipriani again went to Greece, having decided to liberate Crete from the Turkish yoke. The revolution failed, and Cipriani was wounded at Demokos. Popular in Italy, he was elected a Deputy in 1913 and in 1914, but never took his seat, having refused to take the oath of allegiance.

CIPRIANI, Giambattista. Italian painter and engraver, born at Pistoia in 1732; came to England in 1754; died at London in 1785. He was one of the first fellows of the Royal Academy, the diploma of which he designed. In 1761 he also executed the paintings on the royal state coach —the coach which is still used on state occasions. He furnished Bartolozzi with the subjects of some of his finest engravings.

CIRCARS, The Five Northern. An ancient division of the Madras Presidency, on the east coast of India, the circars being Chicacole, Rajahmundry, Ellore, Condapilly, and Guntoor. The districts that now correspond most nearly with them are Ganjam, Vizagapatam, Godavari, and part of Krishna.

CIRCAS'SIA, or TCHERKESSIA. A mountainous region in the south-east of European Russia, lying chiefly on the north slope of the Caucasus, partly also on the south, and bounded on the west by the Black Sea. The mountains, of which the culminating heights are those of Mount Elbruz, are intersected everywhere with steep ravines and clothed with thick forests, and the territory is principally drained by the Kuban and its tributaries. Its climate is temperate, its inhabitants healthy and long-lived.

People.—The people call themselves Adighé, the name *Tcherkess* (robbers) being of Tartar origin. They are divided into several tribes speaking widely different dialects. While they retained their independence their government was of a patriarchal character, but every free Circassian had the right of expressing his opinion in the assemblies. They possessed none but traditional annals and laws. Polygamy was permissible in theory, but not common. The duties of hospitality and vengeance were alike binding, and a Spartan morality existed in the matter of theft. Their religion, which is nominally Moslem, is in many cases a jumble of Christian, Jewish, and heathen traditions and ceremonies. As a race the Circassians are comely, the men being prized by the Russians as warriors, and the women by the Turks as mistresses, a position generally desired by the women themselves.

History.—The early history of Circassia is obscure. Between the tenth and thirteenth centuries it formed a portion of the Empire of Georgia, but in 1424 the Circassians were an independent people, and at war with the Tartans of the Crimea, etc., to whose khans, however, some were occasionally tributary. In 1705 the Tartars were defeated in a decisive battle, but shortly after the territorial encroachments of the Russians on the Caucasian regions began, and in 1829 the country was formally annexed by them. A heroic resistance was made by the Circassians under their leader Schamyl, and on being reduced to submission numbers of the inhabitants emigrated to the Turkish provinces. In the north and east, however, tribes of the Circassian stock remain.—Cf. W. E. Curtis, *Around the Black Sea*.

CIRCE (sêr-sē). In Greek legend, a sorceress, the daughter of Helios and the ocean nymph Perse. She lived in the Island of Ææa, and is represented by Homer as having converted the companions of Ulysses into swine after making them drink enchanted wine. Ulysses, under the

guidance of Hermes, compelled her to restore his companions, and afterwards had two sons by her.

CIR'CINATE. In botany, said of leaves or fronds, as those of ferns, that are rolled up like a watch-spring before expanding.

CIRCLE. A plane figure contained by one line which is called the circumference, and is such that all straight lines drawn from a certain point (the centre) within the figure to the circumference are equal to one another. A *great circle* of a sphere is the line of intersection of the sphere by a plane through the centre, and is the shortest distance between any two points on the sphere. The circumference of a circle is incommensurable with the diameter: *circumference* of circle = diameter $\times \pi$, *area of circle* = diameter squared $\times \frac{\pi}{4}$, where π is a never-ending decimal which is taken approximately as 3·1416, or with less accuracy 3⅐ or $\frac{22}{7}$.—BIBLIOGRAPHY: M'Clelland, *Geometry of the Circle*; E. W. Hobson, *Squaring the Circle*.

CIRCLEVILLE. A town of Ohio, United States, on the Scioto River, 00 miles N.E. from Cincinnati. Pop. 369.

CIRCUIT (sêr'kit). A division of country for judicial purposes, applied to some town or towns to which judges come at regular periods to administer justice. In Britain, a certain number of counties form a circuit, and the courts held at stated times by the appointed judges are called *assizes* or in Scotland) *circuit courts*. (*See* ASSIZES.) The barristers who plead in these courts usually attach themselves to some special circuit.

CIRCUIT (in electricity). A term applied to the closed path traversed by an electric current. Its strength or flow is governed by Ohm's law, which states that the current is directly proportional to the electromotive force in the circuit and inversely proportional to the resistance of the circuit.

CIRCULAR MEASURE. A means of measuring angles in terms of that angle at the centre of a circle which stands upon an arc equal in length to the radius. This angle is constant for all circles, and is called the unit of circular measure or a *radian*. The number of radians in any angle is measured by the fraction $\frac{\text{subtended arc.}}{\text{radius}}$. 2 radians = 180 degrees.

CIRCULAR MOTION. A body will continue to move in a straight line unless it is compelled to change its state by means of an impressed force. In order that the body may move in a circle, this force must be directed *towards* the centre, and produce an acceleration to the centre. It is called the *centripetal force*; it is one aspect of a stress the other aspect of which is called the centrifugal force. *See* CENTRIFUGAL FORCE.

CIRCULAR NOTES. Notes or letters of credit furnished by bankers to persons about to travel abroad. Along with the notes the traveller receives a "letter of indication" bearing the names of certain foreign bankers who will cash such notes on presentation, in which letter the traveller must write his name. On presentation the foreign banker can demand to see the letter of indication, and by causing the presenter to write his name can compare the signature thus made with that in the letter, and so far satisfy himself as to the identity of the person presenting the note. *See* CREDIT, LETTERS OF.

CIRCULATION. In an animal, the flowing of blood from the heart through the arteries to all parts of the body, and its return to the heart by means of the veins. It distributes to all the tissues the nutriment necessary for the maintenance of vitality as well as the oxygen to enable their activities to be performed; and it collects the waste products and conveys them to the organs that eliminate them from the system.

Although Galen, who had observed the opposite directions of the blood in the arteries and veins, may be said to have been upon the very point of discovering the circulation, the discovery was reserved for William Harvey, who in 1628 pointed out the continuity of the connections between the heart, arteries, and veins, the reverse directions taken by the blood in the arteries and veins, the arrangements of valves in the heart and veins so that the blood could flow only in one direction, and the necessity of the return of a large proportion of blood to the heart to maintain the supply. In 1661 Malpighi exhibited microscopically the circulation in the web of a frog's foot, and showed that the blood passed from arteries to veins by capillaries or intermediate vessels.

This finally established the theory with regard to animals, but the movements of sap in vegetables were only traced with difficulty and after numerous experiments. Many physiologists, indeed, are still disposed to refuse the term "circulation" to this portion of the economy of plants; but though sap, unlike the blood, does not exhibit movements in determinate vessels to and from a common centre,

a definite course is observable. In the stem of a dicotyledonous tree, for example, the sap describes a sort of circle, passing upwards from the roots through the newer woody tissue to the leaves, where it is elaborated under the action of air and light; and thence descending through the bark towards the root, where what remains of it is either excreted or mixed with the new fluid entering from the soil for a new period of circulation.

In Infusoria the movement of the fluids of the body is maintained by that of the animal itself and by the disturbing influence of nutritive absorption. In the Cœlenterata (zoophytes, etc.) the movement receives aid besides from the action of cilia on the inner walls of the body. The Annelids, as the earthworm, possess contractile vessels traversing the length of the body. The Insects, Crustaceans, Myriapods, and Spiders have a dorsal tube, a portion of which may be specially developed as a heart. The blood is driven to the tissues, in some cases along arterial trunks, being distributed not in special vessels, but simply through the interstices of the tissues. From the tissues it is conveyed, it may be by special venous trunks, to a venous sinus which surrounds the heart and opens into it by valvular apertures.

The Mollusca have the heart provided with an auricle and a ventricle, as in the snail and whelk; two auricles, one on either side of the ventricle, as in the freshwater mussel; or two auricles and two ventricles, as in the ark-shells. Among the Ascidians, which may be regarded as degenerate representatives of the ancestors of Vertebrates, the remarkable phenomenon is encountered of an alternating current, which is rhythmically propelled for equal periods in opposite directions.

All vertebrated animals (except Amphioxus) have a heart, which in most fishes consists of an auricle and ventricle, but in the mud-fishes (such as Lepidosiren) there are two auricles and one ventricle; and this trilocular heart is found in the Amphibians, and in most reptiles except the crocodiles, which, like birds and mammals, have a four-chambered organ consisting of two auricles and two ventricles. In these two last-named classes the venous and arterial blood are kept apart; in the trilocular hearts the two currents are mixed in the ventricle. For circulation in man and the higher animals, *see* HEART.

CIRCUMCISION. A rite common amongst the Semites, though by no means peculiar to them, and possibly derived by them from the Egyptians or from some non-Semitic source. At any rate, the antiquity of its institution in Egypt is fully established by the monuments, which make it evident that it was practised at a period very much earlier than the Exodus. The priests of Egypt were, beyond question, circumcised, and the upper classes among the Aztecs and Celebes tribes made use of the rite. From this fact we may conclude that circumcision was not looked upon as a mark of slavery or subjection, but rather of nobility and superiority. It was, however, a primitive Arab custom, and its practice amongst the Jews may with equal probability be assigned to an Arab source.

Whatever its origin, the rite is confined to no single race. It was practised by some of the peoples of Central America, and is still to be found amongst tribes on the Amazon, amongst the Australian tribes, the Papuans, the inhabitants of New Caledonia, and those of the New Hebrides. In Africa it is common amongst the Kaffirs and other tribes widely removed from Semitic influence. It is practised also by the Abyssinian Christians, and although not enjoined in the Koran has been adopted by the Mohammedans on the example of Mohammed himself. It was possibly in its origin a sacrifice to the deity presiding over generation, though in certain nations the rite has acquired a new symbolic significance according to the stage of their spiritual development. The operation is also practised in modern surgery for sanitary and therapeutic reasons.—Cf. articles in *Jewish Encyclopedia* and *Dictionary of the Bible.*

Circumcision is also the name of a feast, celebrated on the 1st of Jan., in commemoration of the circumcision of our Saviour. It was anciently kept as a fast, in opposition to the pagan feast on that day in honour of Janus.

CIRCUMNAV'IGATORS. A term usually applied to the early navigators who sailed round the world. Magellan, a Portuguese in the service of Spain, headed the first expedition which succeeded in circumnavigating the globe, though he did not live to complete the voyage. He sailed with five ships from San Lucar, 20th Sept., 1519, passed the straits named after him in Nov., 1520, and was killed in the Philippine Islands in April, 1521, Juan Sebastian del Cano continuing the voyage and reaching San Lucar with the only remaining ship in Sept., 1522.

The principal early navigators, after Magellan, who succeeded in making the voyage round the globe were Grijalva and Alvaradi (Span-

lards), 1537; Mendana (Spanish), 1567; Drake (English), 1577-80; Cavendish 1586-88; Le Maire (Dutch), 1615-17; Quiros (Spanish), 1625; Tasman (Dutch), 1642; Cowley, 1683; Dampier, 1689; Cooke, 1708; Clipperton, 1719; Roggewein (Dutch), 1721-23; Anson, 1740-44; Byron, 1764-66; Wallis, 1766-68; Carteret, 1766-69; Bougainville, 1766-69; Cook, 1768-71; and Portlocke, 1788.

CIRCUMNUTA'TION (literally "a nodding round about"). A name given by Darwin to the continuous motion of every growing part of every plant, in which it describes irregular elliptical or oval figures. The apex of the stem, for instance, after pointing in one direction, moves round till it points in the opposite direction, and so on continuously.

CIRCUMVALLA'TION, or LINE OF CIRCUMVALLATION. In field-engineering, a line of field-works consisting of a rampart or parapet, with a trench surrounding a besieged place, or the camp of a besieging army.

CIR'CUS. Among the Romans, a nearly oblong building without a roof, in which public chariot-races and exhibitions of pugilism and wrestling, etc., took place. It was rectangular, except that one short side formed a half-circle; and on both sides, and at the semicircular end, were the seats of the spectators, rising gradually one above another, like steps. On the outside the circus was surrounded by colonnades, galleries, shops, and public places. The largest of these buildings in Rome was the *Circus Maximus*, capable, according to Pliny, of containing 260,000, and according to Aurelius Victor, 385,000 spectators. At present, however, but few vestiges of it remain.

The games celebrated in these structures were known collectively by the name of *ludi circenses*, or games of the circus, which under the emperors attained the greatest magnificence. The principal games of the circus were the *ludi Romani* or *magni* (Roman or Great Games), which were celebrated from the 4th to the 14th of Sept., in honour of the *great gods*, so called. The passion of the common or poorer class of people for these shows appears from Juvenal's saying that they anxiously desired two things only—*panem et circenses* (bread and the games!). The festival was opened by a splendid procession, or *pompa*, in which the magistrates, Senate, priests, augurs, vestal virgins, and athletes took part, carrying with them the images of the great gods, the Sibylline books, and sometimes the spoils of war.

On reaching the circus the procession went round once in a circle, the sacrifices were performed, the spectators took their places, and the games commenced. These were: 1. Races with horses and chariots, in which men of the highest rank engaged. 2. The gymnastic contests. 3. The Trojan games, prize contests on horseback, revived by Julius Cæsar. 4. The combats with wild beasts, in which beasts fought with beasts or with men (criminals or volunteers). 5. Representations of naval engagements (*naumachiæ*), for which purpose the circus could be laid under water. The expense of these games was often immense. Pompey, in his second consulship, brought forward 500 lions at one combat of wild beasts, which, with eighteen elephants, were slain in five days.

The circus of to-day is a milder show of feats of horsemanship and gymnastics and tricks of trained animals, interspersed with clever and amusing clowning. The popularity of the modern circus in England may be traced to that kept by Philip Astley at the end of the eighteenth century.—BIBLIOGRAPHY: article in Smith's *Dictionary of Antiquities*; G. Sanger, *Seventy Years a Showman*.

CIRENCESTER, or **CICESTER** (pron. colloquially sis'e-ter or sis'es-ter). A town of England, county and 17 miles S.E. of Gloucester; founded by the ancient Britons, and subsequently, under the name of Corinium, a Roman station. It has a well-known Royal Agricultural College. The trade is chiefly agricultural. Cirencester unites with Tewkesbury (since 1918) in returning one of the four members to Parliament for Gloucestershire. Pop. (1931), 7200.

CIRRHO'SIS. A disease characterized by growth of fibrous tissue which gradually encroaches on and by compression destroys the true structure of the organ attacked. It frequently attacks the liver as a consequence of spirit-drinking; and hence the term "drunkard's liver."

CIRRIPEDES (sir'i-pēdz), **CIRRIPE'DIA,** or **CIRRHOP'ODA.** A class of marine invertebrate animals, having a soft body provided with very long, jointed, tendril-like limbs (*cirri*), which are protruded and rapidly withdrawn within the multi-valve shell. They are crustaceans which have undergone retrograde metamorphosis, being free-swimming in the larva form, but becoming after a time attached by the head. When adult they are affixed to some substance, either set directly upon it, as in the acorn barnacle; or placed

on a stalk, as the ship barnacle; or sunk into the supporting substance, as the whale-barnacle.

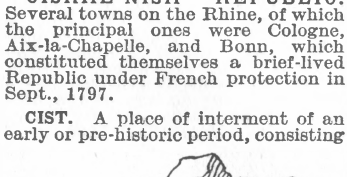
CIRTA. The capital of the ancient Massylii, in Numidia. After the defeat of Jugurtha it passed into the hands of the Romans, and was restored by Constantine, who gave it his own name.

CISAL'PINE REPUBLIC. A state set up in 1797 by Napoleon I. in North Italy, recognized by Germany as an independent power at the Peace of Campo-Formio. It comprised Austrian Lombardy, together with the Mantuan and the Venetian provinces, Bergamo, Brescia, Crema, Verona, and Rovigo, the duchy of Modena, the principality of Massa and Carrara, Bologna, Ferrara, and Romagna. The Republic had a territory of 16,337 sq. miles, and a pop. of 3,500,000. The legislative body held its sessions in Milan. On 25th Jan., 1802, it received the name of the *Italian Republic*; from 1805 to 1814 it formed part of the Kingdom of Italy; and it was given to Austria by the Congress of Vienna in 1815 as the Lombardo-Venetian Kingdom.

CIS'PADANE REPUBLIC. A state on the south of the Po set up by Napoleon I. in 1796, but speedily united with the Transpadane Republic to form the Cisalpine Republic.

CISRHE'NISH REPUBLIC. Several towns on the Rhine, of which the principal ones were Cologne, Aix-la-Chapelle, and Bonn, which constituted themselves a brief-lived Republic under French protection in Sept., 1797.

CIST. A place of interment of an early or pre-historic period, consisting



Cist

of a rectangular stone chest or enclosure formed of rows of stones set upright, and covered by similar flat stones. Such cists are found in barrows or mounds, enclosing bones. In rocky districts cists were sometimes hewn in the rock itself.

CISTA'CEÆ. A nat. ord. of polypetalous Dicotyledons, consisting of low shrubby plants or herbs with entire leaves and crumpled, generally ephemeral, showy flowers. Some exude a balsamic resin, such as ladanum from a Levant species of Cistus. Four species of the genus Helianthemum are found in Britain, and are popularly known as "rock roses." *See* CISTUS.

CISTER'CIANS. A religious order named from its original convent, Cîteaux (*Cistercium*), not far from Dijon, in Eastern France, where the society was formed in 1098 by Robert, Abbot of Molesme, who enforced strict observance of the rule of St. Benedict. The Cistercians led a severely ascetic and contemplative life, and, having freed themselves from episcopal supervision, formed a kind of spiritual republic under a high council of twenty-five members, with the Abbot of Cîteaux as president. Robert's successor, Alberic, died in 1109, and was succeeded by Stephen Harding, an Englishman, who enforced the rule of poverty with the utmost rigour.

Next to Cîteaux the four chief monasteries were La Ferté, Pontigny, Clairvaux (founded by the celebrated St. Bernard in 1115), and Morimond. In France they called themselves *Bernardines* in honour of St. Bernard. Among the fraternities emanating from them the most remarkable were the Barefooted monks, or Feuillants, and the nuns of Port Royal, in France; the Recollets, or reformed Cistercians; and the monks of La Trappe.

There were a hundred Cistercian houses in England at the dissolution of monasteries. The general fate of religious orders during the French Revolution reduced the Cistercians to a few convents in Spain, Poland, Austria, etc. There are still two or three houses in the British Isles. The Cistercians wear white robes with black scapularies. The first Cistercian monastery for women was established at Tart, in the diocese of Langres (now Dijon), in the year 1125. BIBLIOGRAPHY: Helyot, *Histoire des ordres religieux*; Henry Collins, *Spirit and Mission of the Cistercian Order*; Janauschek, *Origines Cistercienses*; J. S. Fletcher, *The Cistercians in Yorkshire.*

CISTUS. A genus, ord. Cistaceæ, natives of the Mediterranean region. Some of them are beautiful evergreen flowering shrubs, ornamental in gardens or shrubberies. Gum ladanum is obtained from *C. creticus* and *C. ladaniferus.* *See* CISTACEÆ.

CIT'ADEL. A strong fortress in or near a city intended to keep the inhabitants in subjection, or to form

a final point of defence in case of an attack of enemies.

CITA'TION. A summons or official notice given to a person to appear in a court as a party or witness in a cause.

CÎTEAUX (sē-tō). A village of Eastern France, department of Côte-d'Or, where the orginal convent of the Cistercians was built.

CITHÆ'RON (the modern **ELATE'A**). A mountain of Greece, which, stretching N.W., separates Bœotiafrom Megaris and Attica. Its loftiest summit is 4620 feet in height. On its northern slope stood the city of Platæa.

CITHARA (Lat. *cithara*, Gr. *kithara*, Heb. *kinura*). One of the most ancient stringed instruments, of triangular shape, with from four to twenty strings. It is traced back to 1700 B.C. among the Semitic races, in Egypt, Assyria, Greece, and the Roman Empire. The *cithern* or *cittern* (Fr. *citre*, Ger. *zither*), a later variety of the cithara, is an old instrument of the guitar kind, strung with wire instead of gut, and played with a plectrum or quill. Its eight strings were tuned to four notes, G, B, D, and E. It was frequently to be found in barbers' shops for the amusement of the waiting customers. The popularity of the cithern was at its height in England in the sixteenth and seventeenth centuries.

CITIES OF REFUGE. Six out of the forty-eight cities given to the tribe of Levi in the division of Canaan, set apart by the law of Moses as places of refuge for the manslayer or accidental homicide. Their names were Kedesh, Shechem, and Hebron on the west side of Jordan; and Bezer, Ramoth-Gilead, and Golan on the east.

CIT'RIC ACID ($C_6H_8O_7$). The acid of lemons, limes, and other fruits. It is generally prepared from lemon-juice, and when pure is white, inodorous, and extremely sharp in its taste. In combination with metals it forms cyrstalline salts known as citrates. The acid is used as a discharge in calico-printing and as a substitute for lemon in making beverages.

CIT'RON. *See* CITRUS.

CITRONELLA OIL. An oil obtained from a kind of grass (*Cymbopōgon nardus*), cultivated at Singapore and in Ceylon. It is used for scenting soap.

CIT'RUS. An important genus of trees, nat. ord. Rutaceæ, characterized by simple ovate acuminate leaves or leaflets united by a distinct joint to the leaf-like stalk, by having the stamens united by their filaments into several irregular bundles, and by yielding a pulpy fruit with a spongy rind.

Citrus Mĕdica is the citron with its varieties *C. Limonum*, the lemon, and *C. acida*, the lime. Other species are the sweet orange (*Citrus aurantium*), the shaddock and grape fruit (*Citrus decumāna*), with varieties. *C Bergama*, the bergamot, and *C. Bigaradia*, the Seville or bitter orange, the mandarin (*C. nobilis*), and the kumquat (*C. suntara*). The orange would seem to have originated in China, the citron in Persia, and the lemon in

Citron

Arabia. The best citrons and lemons come from Spain, Portugal, the Canaries, and the Azores. The genus Citrus furnishes the essential oils of orange and lemon peels, of orange flowers, of citron peel, of bergamot, and oil of orange leaves—all much esteemed in perfumery. *See* LEMON; ORANGE.

CITTADELLA (chĕt-tä'-). An old town of North Italy, province of Padua, surrounded by walls. Pop. 9750.

CITTÀ-DI-CASTELLO. A town, Italy, province of Perugia, on the Tiber, the seat of a bishop, with a cathedral containing valuable paintings. Pop. 27,700.

CITTÀ-VECCHIA (chĕt-tä-vek'i-à, "old city"), a fortified town of Malta, near the centre and almost on the highest point of the island, 7 miles W.S.W. of Valetta. The rise of the latter town has almost ruined it, and its magnificent houses and

palaces are almost deserted. It has a large cathedral and interesting catacombs. The ancient palace of the Grand-Masters of the Order of Malta also remains. Pop. 7600.

CITY (Lat. *civitas*). In a general sense, a town holding, from extent of population, favourable situation, or other causes, a leading place in the community in which it is situated. Popularly, also, it is used, both in Britain and France, to designate the old and central nucleus as distinguished from the suburban growths of large towns. The ecclesiastical sense of the term city is a town which is, or has been, the see of a bishop. This seems to be the historical use of the term in England, and still possesses some authority there, but to a considerable extent it has been superseded by the wider one.

Since the latter part of the nineteenth century the official style of city has, in the United Kingdom, been conferred by royal authority on certain important towns, Birmingham being the first to be so distinguished in 1889. In America the application of the term is dependent upon the nature and extent of the municipal privileges possessed by corporations, and a town is raised to the dignity of a city by special charter. Generally the term implies the existence of a mayor at the head of the municipality.

CIUDAD (thi-ō-*dȧd'*). The Spanish word for city, appearing in many names of Spanish places.

CUIDAD BOLIVAR (thi-ō-*dȧd'* bo-lē'vär). *See* ANGOSTURA.

CIUDADELA (thi-ō-*dȧ-dā'lȧ*). A walled city and seaport, on the west side of the island of Minorca. Chief industries: weaving woollen fabrics, oil and wine manufacturing, and husbandry. Pop. 9370.

CIUDAD-REAL (thi-ō-*dȧd*-rā-ȧl', "royal town"), a town of Spain, capital of the province of same name, on a low plain near the Guadiana, 100 miles south of Madrid. The principal edifice is the church of Santa Maria, a magnificent structure, though consisting only of a single nave. Pop. 23,401. The province occupies the south extremity of New Castile, between the parallel ranges of the Sierra Toledo and Sierra Morena; it is rich in quicksilver; area, 7620 sq. miles. Pop. 504,566.

CIUDAD-RODRIGO (thi-ō-*dȧd*-rod-rē'gō, "Roderick-town"). A fortress in Spain, in Leon, on the River Aguada, was a place of considerable importance in early Spanish history as a fortress on the Portuguese frontier, and was of some importance in the Peninsular War, being taken by storm by the British under Wellington, after a siege of eleven days. The Cortes gave Wellington the title of Duke of Ciudad-Rodrigo. Pop. 10,000.

CIV'ET (Viverra). A genus of medium-sized carnivorous mammals found in Africa and South Asia, and distinguished by having a secretory apparatus in which collects the odoriferous fatty substance known as *civet*. The chief species are the common civet (*Viverra civetta*) of Central and North Africa, and the Zibeth (*V. zibetha*) of South Asia. Civets are

Indian Civet (*Viverra zibetha*)

about the size of a fox, the Asiat species somewhat smaller. They a marked with dark spots or blotch of a yellowish-grey background, ar are nocturnal in habit, preying c birds and small mammals. Tl pouch is situated between the an and the genitals, and the odoro matter obtained from it is, wh good, of a clear yellowish or brov colour, and of about the consisten of butter. In its natural state t smell is powerful and very offensiv but when largely diluted with oil other materials it becomes an agr able perfume.

CIV'IC CROWN. Among t Romans, the highest military rewa assigned to him who had preserv

the life of a citizen. It bore the inscription "*Ob civem servatum*," that is, "for saving a citizen," and was made of oak leaves. The person who received the crown wore it in the theatre, and sat next the Senators, and when he came in all the assembly rose up as a mark of respect.

CIVICS. The science of civil government, of the principles of government in their application to society, and of the rights and duties of citizenship. It thus deals not only with citizenship, but also with the relations between citizens and the Government. The science includes: Ethics, Civil Polity, Economics, Law and History of Civic Development. The term, now used in the place of civil government, was first introduced by Henry Randall Waite. The American Civic Association "for the cultivation of higher ideals of civic life and beauty in America," and for the advancement of city planning, was founded in 1904.

CIVIDALE (chē-vō-dā'lā) **DEL FRIULI.** A walled town, Italy, Venetia, 8 miles E.N.E. of Udine. It has a large cathedral dating from the eighth century. The town was captured by Austro-German troops during the European War (17th Oct., 1917). Pop. 10,031.

CIVIL ENGINEER. Term used in contra-distinction to that of military engineer, the nature of the work being concerned with all branches of civil construction. This includes the designing and building of bridges, tunnels, dams and reservoirs and foundations, the construction of roads, docks, harbours, and canals, also the problems of irrigation and reclamation of land.

Civil engineering is taught at most of the universities and colleges, and some give degrees in the subject. The directing body of the profession is the Institution of Civil Engineers at Great George St., London, S.W.1.

CIVIL WAR. Any war between parties in the same country. The Romans had their civil wars, as later had France and other countries that arose out of the empire. In England the Barons' War and the Wars of the Roses were civil wars, but the term Civil War, or Great Civil War, is usually reserved for the struggle between Charles I. and the Parliamentarians that began in 1642 and lasted until 1649. The greatest of all civil wars was that between North and South in the United States; called the American Civil War, it lasted from 1861 to 1865.

CIVILIZA'TION (Lat. *civilis*, pertaining to a citizen). In its literal sense, a social condition existing under the forms and government of an organized State. From the more limited sense, however, the term has gradually been extended in meaning, and in current general use it has come to imply the sum at any given time of the attainments and tendencies by which the human race or any section of it is removed from the savage state and a condition of barbarism.

Early Development.—The history of progress in civilization is usually presented from one of two points of view—the first conceiving the race as starting from a high civilization, to which in point of intellectual and moral power it has yet to return; the second viewing the civilization of any period as the result of a constant and increasingly successful stream of effort upwards from an origin comparable with the condition of the lower animals.

The latter is the prevailing scientific theory, which finds the secret of progress in the inter-action of function and environment. According to it primitive man, at first feeding on wild fruits and berries, and sheltering himself under overhanging rocks or caves, entered upon the Stone Age, in which, as the contemporary of the Mammoth and cave-bear, he made himself sharp-edged tools by chipping the flakes of flint found in the drift under gravel and clay. In the newer Stone Age he learned the art of polishing these rough implements, with which he cut down trees to make canoes, killed wild animals for food, and broke their bones for marrow, or shaped them into weapons. Fire he turned to account to hollow out trees, to cook his food, to fashion clay-ware. Artificial means of shelter were constructed by piling rude huts of stones, by digging holes in the ground, or by driving piles into the beds of lakes and raising dwellings on them.

The artistic instincts found expression in drawings of animals scratched upon bone or slate. The discovery of metals constituted a great step in advance. Gold and copper came early into use, and bronze was soon discovered, though a long time passed before iron was smelted and substituted for bronze where hardness was required.

Gradually the roving savage became a nomadic shepherd and herdsman, or a tiller of the soil, according to his environment. The practice of barter was in part superseded by the beginnings of some sort of currency. Gesture language gave place in part to an enlarged vocabulary, and picture-writing to the use of phonetic signs.

Religion.—In the meantime man

had begun to question himself and the world on profounder issues, entering upon the myth-making age, in which was projected outwards on the chief phenomena of nature some shadow of his own personality. The worship of the sun, moon, and stars, a faith in a future life, the worship of dead ancestors, fetishes, or animals, the belief in magic and witchcraft, all sprang into being. Prayer came spontaneously to him; the idea of propitiation by sacrifice would arise from his dealings with his fellows and his foes; the sacred books began to shape themselves.

Evolution of Society.—Tribal and national relations, arising from ties of family and exigencies of defence, were cemented by unity of faith, and the higher social unit began to perfect itself under the rule of the patriarch or the bravest warrior. With varying needs, arising from diversity of environment, distinctions of nationality became more and more emphatic, and the history of civilization becomes the history of the nations viewed from the philosophic standpoint.

Whilst, however, in the early stages of the development of civilization the social organization tended to be coextensive with the boundaries of State or nation, it is tending to be no longer so, in consequence of the deepening of social consciousness. The social organism may still include the political State, but it tends to become a unity possessing a far deeper and wider meaning. It is now in the ethical, spiritual, and philosophical conceptions that the whole question of the further development of civilization centres. *See* SOCIOLOGY. BIBLIOGRAPHY: E. B. Tylor, *Primitive Culture*; Sir J. G. Frazer, *Golden Bough*; C. H. Pearson, *National Life and Character*; Lord Avebury, *Origin of Civiliaztion*; T. H. Buckle, *The History of Civilization in England*; J. W. Draper, *History of the Intellectual Development of Europe*; Benjamin Kidd, *Principles of Western Civilization*; C. Seignobos, *Histoire de la Civilization*; H. Proctor, *The Evolution of Culture*; E. Majewski, *La Science de la Civilisation*; J. D. Forrest, *The Development of Western Civilization.*

CIVIL LAW (jus civile). Among the Romans the term nearly corresponding to what in modern times is implied by the phrase *positive law*, that is, the rules of right established by any Government. They contradistinguished it from natural law (*jus naturāle*), by which they meant a certain natural order followed by all living beings: also from the general laws of mankind established by the agreement of all nations and Governments (*jus gentium*). With the growth and multiplication of the edicts issued by the prætors (in whose hands was the supreme administration of justice) for the modification and extension of the positive enactments a further distinction became necessary, the whole body of this prætorian law being known by the name of *jus honorarium* as opposed to the strict formal law (*jus civile*). The latter, however, included both the private law (*jus privātum*), which relates to the various legal relations of the different members of the State—the citizens—and the public law (*jus publicum*), that is, the rules respecting the limits, rights, obligations, etc., of the public authorities.

The final digest of Roman law was made in the sixth century A.D. under the Emperor Justinian, but at first was only admitted as formally binding in a small part of Italy. After the eleventh century, in Upper Italy, particularly in the school of Bologna, the body of the Roman law, put together by Justinian, was formed by degrees into a system applicable to the wants of all nations; and on this model the ecclesiastical and Papal decrees were arranged, and to a considerable degree the native laws of the new Teutonic states.

From all these the Roman law was distinguished under the name of *civil law*. In this sense, therefore, *civil law* means *ancient Roman law*; and it is contradistinguished from *canon law* and *feudal law*, though the feudal codes of the Lombards have been received into the *corpus juris civilis*, or body of civil law. As the Roman code exerted the greatest influence on the private law of modern Europe, the expression *civil law* is also used to embrace all the rules relating to the private rights of citizens.

Under the term *civil law*, therefore, in both Europe and America, is to be understood not only the Roman law, but also the modern private law of the various countries; for example, in Germany, *Das gemeine Deutsche Privatrecht*; in France, the *Code civil des Français* or *Code Napoléon*. In this sense it is chiefly opposed to *criminal law*, particularly in reference to the administration of justice, which is to be divided into *civil justice* and *criminal justice*. *See* CANON LAW; ROMAN LAW.

CIVIL LIST. In Britain, formerly the whole expenses of the Government, with the exception of those of the army, navy, and other military departments. It is now limited to the expenses proper to the maintenance of the household of the sovereign.

It was once a principle in England that the monarch was to pay all the expenses of Government, even including those of the army, from the possessions of the Crown, and until the Restoration the whole expenses of the Government continued to be defrayed out of the royal revenue.

In the reign of William, the Commons adopted the principle of separating the regular and domestic expenses of the king from the public expenditure, and establishing a systematic and periodical control over the latter. The amount actually voted to the king for life in 1697 was £700,000, and the same vote was made at the commencement of the reign of Queen Anne and George I. By the beginning of the reign of George II. the revenue appropriated to the Civil List was found to have produced £830,000, and this sum was voted on the accession of George II. Besides the regular vote, grants had been frequently made to defray debts incurred in the expenditure of the sovereign.

On the accession of George III. the Civil List was fixed at £800,000, but instead of being paid out of appropriated revenues in which the Crown lands were included, these were surrendered, and it was charged on the ordinary taxation. Large extra grants had to be made during this reign. In the reign of William IV. the List was cleared of all salaries, etc., upon it, and placed at £510,000, including a Pension List of £75,000. On the accession of Victoria a Civil List of £385,000 per annum was settled on Her Majesty for life, the Civil List being limited to the support of Her Majesty's household and the maintenance of the dignity of the Crown.

Under the Act of 1901 the Civil List of the king was fixed at £470,000, whilst annuities of £20,000 and £10,000 were provided for the Prince and Princess of Wales respectively. The Civil List of 1910 was also fixed at £470,000, or, including provision for other members of the royal family, at £616,000. No provision, however, was made for the Prince of Wales in the Civil List of 1910, as the income of the Duchy of Cornwall (£87,000) was regarded as sufficient. In the event of the Prince's marrying, the Princess of Wales will receive £10,000 per annum. Many continental states have a fixed Civil List: that of Russia was £1,630,000; of Austria, £940,000; of Prussia, £885,964; the Civil List of the Sultan of Turkey is £1,000,000.

CIVIL SERVICE, The. Includes all offices under Government, exclusive of those directly connected with the army and navy. In Great Britain it comprises the Home Office, Foreign Office, Treasury, War Office, Admiralty, Post Office, Customs, Inland Revenue, and other departments. Formerly appointments to the civil service in Great Britain lay wholly in the gift of the executive Government, and were obtained by influence, the bestowal of them being largely used for gaining parliamentary support for the ministry in power. Originally a candidate was not required to pass any examination before entering on his duties; but in 1855 a system of examinations was instituted to test the efficiency of candidates; and in 1870 an Order in Council directed that henceforth appointments in the civil service should, with certain exceptions, be filled by open competition, as was already the case with the Indian civil service.

Conditions of Entry.—The examining commissioners are required to assure themselves that both the candidate and his father are natural-born British subjects; that the candidate's age is within the prescribed limits; that he is free from any physical defect likely to interfere with the proper discharge of his duties; that his character is such as to fit him for public employment; and that he possesses sufficient ability for his future service to the State. On the last-named point the candidate is tested by a probation of six months after having been successful in the open competition.

Appointments to ordinary clerkships in the civil service fall into two divisions or grades: the limits of age for the higher are 22 to 24, and for the lower 17 to 20. In the higher division the salaries are much better than in that below, the examinations being correspondingly more severe. A large number of subordinate appointments in the postal and telegraph service, customs, etc., are on a different footing. For many competitive appointments special qualifications, scientific or technical, accompanied by special age limits, are laid down. Certain positions in the post office and telegraph service are open to women. A considerable number of boy clerks is also employed. In the case of a position needing to be filled by a person of mature age and particular qualifications, the appointment may be made without previous examination.

Superannuation allowances are granted on the following general scale: one-eightieth of salary for each year of service, together with a lump sum allowance equal to one-

thirtieth of salary for each year of service; a gratuity is payable in the event of death during service at the rate of a year's pay or more.

The **Indian Civil Service**, for which examinations are held in Britain, is a distinct branch, some Indian appointments being worth £5000 a year and more. (*See* the separate article INDIAN CIVIL SERVICE.) In the *Civil Service Estimates* of Great Britain is included all expenditure not incurred for the maintenance of the army and navy; that for education, law and justice, public works, etc., in addition to the salaries of the various public departments. The total expenditure rose, during the European War, to about £70,000,000 annually.

In the **United States Civil Service** there still prevails the system which places a large number of appointments in the hands of the party in power, with the result that each Presidential Election is accompanied by a far-reaching dismissal of officials and the instalment of their successors. This state of things, based on the principle that "to the victors belong the spoils," is one which many of America's leading statesmen would willingly see changed. — BIBLIOGRAPHY: Anson, *Law and Custom of the Constitution*; Cassell's *Guide to Employment in the Civil Service*; G. E. Skerry, *Civil Service Manual*; R. Moses, *The Civil Service of Great Britain*; F. G. Heath, *The British Civil Service*; E. A. Carr, *How to enter the Civil Service*.

CIVITA (chĕ'vĕ-tä). In geography, the Italian form of the Lat. *civitas*, appearing in many names of towns.

CIVITANOVA (chĕ-vĕ-tä-nō'vä). A town of Central Italy, near the Adriatic, 12 miles west of Macerata. Pop. 11,350.

CIVITA VECCHIA (chĕ-vĕ-tä vek'i-ä). One of the best seaports of Central Italy, lying in a barren and unhealthy district, 38 miles N.W. of Rome. It is a fortified naval port, and has an arsenal, shipyards, cathedral, etc. Pop. 23,300.

CLACKMAN'NAN. The smallest county of Scotland, containing little more than 54 sq. miles, or 34,927 acres, situated on the north side of the Forth, by which it is bounded on the south-west, while on nearly all the other sides it is enclosed by the counties of Perth and Stirling. The north part of the county is occupied by the Ochil Hills, which are largely given up to sheep-farming, but the other portions are comparatively level and exceedingly fertile, yielding large crops of wheat and beans.

The minerals are valuable, especially coal, which abounds. There are also some extensive ironworks, and some large breweries and distilleries; woollens are also manufactured, and tanning and glass-blowing, carried on. The principal towns are Alloa, Alva, Tillicoultry, Dollar, and Clackmannan. The last is nominally the county town, but Alloa is much more important. Since the redistribution of 1918 Clackmannan unites with Stirling in returning two members to Parliament. Pop. of county (1931), 31,947.

CLACTON-ON-SEA. A rising watering-place of England, on the Essex coast, 16¼ miles by rail from Colchester. It has a new town hall, convalescent homes, pier, sea-wall, and marine parade, and good bathing facilities. Pop. (urban district) (1931), 15,851.

CLA'DIUM. A genus of plants, of wide distribution, nat. ord, Cyperaceæ (or sedges). The *C. Mariscus*, or twig-rush, has keeled leaves, with a sharp point and prickly serratures. It is very common in certain fenny districts in Cambridgeshire, etc., and is used for thatching.

CLADONIA. *See* REINDEER MOSS.

CLADOPHORA. A genus of filamentous Green Algæ, group Siphonocladeæ, comprising both marine and freshwater forms, many of them growing in swiftly flowing water or on surf-beaten rocks.

CLAIRAUT (klā-rō), **Alexis Claude** Mathematician, born at Paris in 1713, died in 1765. In his eleventh year he composed a treatise on the four curves of the third order, which with his subsequent *Recherches sur les Courbes à double Courbure* (1731) secured his election to the Academy at the age of eighteen. He accompanied Maupertuis to Lapland, to assist in measuring an arc of the meridian, and obtained the material for his work *Sur la Figure de la Terre*. In 1752 he published his *Théorie de la Lune*, and in 1759 calculated the perihelion of Halley's comet.—His brother, who died at the age of twelve, published in his ninth year a treatise entitled *Diverses Quadratures Circulaires Elliptiques*.

CLAIRE, St., or SANTA CLARA, Order of. Founded in 1212 by a lady of this name, of noble birth, born at Spoleto, Italy, in 1193, died in 1253, and canonized in 1255. The order is divided into a severe sect, the Damianists, and a more moderate sect, the Urbanists. It has numerous convents in Europe and America.

CLAIRVAUX (klăr-vō). A village, France, department of Aube, celebrated for its magnificent abbey, founded in 1114 or 1115 by St. Bernard, but suppressed at the Revolution. The existing buildings have been converted into an immense house of correction.

CLAIRVOYANCE (that is "clear-seeing"). An alleged faculty by which certain persons in certain states, or under certain conditions, are said to be able to see things by some sort of mental or spiritual vision apart altogether from the sense of sight; thus they are said to be able to tell what an absent person is doing, to describe the contents of a closed box, etc. It is claimed that clairvoyance is the result of a kind of natural state of trance, or may be induced by mesmerism; and in evidence of its existence in ancient times the utterances of prophets, sibyls, etc., have been adduced.—BIBLIOGRAPHY: F. W. H. Myers, *Human Personality*; E. H. Grey, *Visions, Previsions, and Miracles in Modern Times*; J. C. F. Grumbine, *Clairvoyance*.

CLAM. The popular name of certain bivalve shell-fish used as food in the United States. The best-known species are *Venus mercenaria*, *Mactra solidissima*, and *Mya arenaria*.

CLAMECY (klăm-sē). A town of France, department of Nièvre, on the Yonne. It has a fine church, founded in 1497. Wood-rafts for the supply of Paris with fire-wood are made up here, and floated down the Yonne and Seine. Pop. 4960.

CLAN (Gael. *clann*, a tribe or family). Among the Highlanders of Scotland, a community of people descending from a common ancestor, and usually settled in one place or district. A clan was under the patriarchal control of a chief, who represented the common ancestor. The name of the clan was frequently formed from that of the original progenitor with the affix *mac* (son): thus the MacDonalds were the sons of Donald, and every individual of this name was considered a descendant of the founder of the clan, and a brother of every one of its members.

The chief exercised his authority by right of primogeniture, as the father of his clan: the clansmen revered and served the chief with the blind devotion of children. The clans each occupied a certain portion of the country, and hostilities with neighbouring clans were extremely common. Next in rank to the chief were a certain number of persons, commonly near relations of the chief, to whom portions of land were assigned, during pleasure or on short leases. Each of these usually had a subdivision of the clan under him, of which he was chieftain, subject, however, to the general head of the sept.

The jurisdiction of the chiefs was not very accurately defined, and it was necessary to consult, in some measure, the opinions of the most influential clansmen and the general wishes of the whole body. In later times it was the policy of the Government in Scotland to oblige the clans to find a representative of rank to become security at court for their good behaviour; the clans who could not procure a suitable representative, or who were unwilling to do so, were called broken clans, and existed in a sort of outlawry. The most notable instance of a proscribed and persecuted clan was that of the ancient clan MacGregor, who long continued to hold their lands by the *coir a glaive*, or right of the sword.

The rebellions of 1715 and 1745 induced the British Government to break up the connection which subsisted between the chiefs and the clansmen. The hereditary jurisdiction of the chiefs was therefore abolished, the people disarmed, and even compelled to relinquish their national dress. Few traces of this institution now remain, except such as have a merely sentimental character; thus all those who possess the same clan name may still talk of their "chief," though the latter have now neither land nor influence.

CLAN-NA-GAEL (găl). Irish secret society. It was founded in Philadelphia in 1881 by Fenians who wished to make Ireland independent. After a period of great activity it died away. The term means "clan of the Gaels."

CLANRICARDE, Earl of. Irish title long borne by the family of de Burgh, or Burke, and now by the Marquess of Sligo. In 1543 Ulick de Burgh, a great land-owner in Connaught, was made Earl of Clanricarde. Two succeeding earls were made marquesses, but in both cases the newer title died out and the older one passed to another branch of the family.

John, the 14th earl (1802-74), was a Conservative politician and ambassador in St. Petersburg. He married a daughter of George Canning and was made a marquess in 1826. His son, **Hubert George de Burgh,** the 2nd marquess (1832-1916), was known for his resistance to the policy of land purchase. He died 12th April, 1916, leaving his great wealth to his nephew, Viscount Lascelles,

later Earl of Harewood. His marquessate lapsed, but the earldom passed to the Marquess of Sligo.

CLAP'HAM. A southern suburban district of London. Clapham Common is a fine open space of over 200 acres. A parliamentary borough till 1918, Clapham now gives its name to one of the five parliamentary divisions of the metropolitan borough of Wandsworth.

CLAP-NET. A ground-net used by bird-catchers, consisting of two equal parts about 12 yards long by 2½ wide, and each having a slight frame. They are placed about 4 yards apart, and are pulled over by a string so as to enclose any birds on the intervening space.

CLAP'PERTON, Hugh. African traveller, born in Annan, Dumfriesshire, in 1788. He entered the merchant service, but was impressed into the navy, in which he became a lieutenant in 1816. He then accompanied Dr. Oudney and Lieutenant Denham to Africa, where he remained till 1825, returning with valuable information, although the disputed question of the course of the Niger was left undecided.

On his return to England Clapperton received the rank of captain, and immediately engaged in a second expedition, to start from the Bight of Benin. Leaving Badagry, Dec., 1825, he penetrated to Katunga, within 30 miles of the Quorra or Niger, but was not permitted to visit it. At Sokoto the Sultan Bello refused to allow him to proceed to Bornu, and detained him a long time in his capital. He was seized with an attack of dysentery, and died on the 13th of April, 1827, at Chungary, a village near Sokoto. He was the first European who traversed the whole of Central Africa from the Bight of Benin to the Mediterranean.

CLAQUEURS (klâ-keurz). The name given in Paris to a company of persons paid for applauding theatrical performances, more especially on the production of any new piece. They were sometimes called *chevaliers-dulustre*, from mustering in great force near the centre of the pit, below the chandelier. This theatrical institution may be traced to the beginning of the nineteenth century, although a French poet of the sixteenth century had already conceived the idea of the *claque*. It is abolished in the Grand Opéra and the Comédie Française.

CLARA, Santa. *See* CLAIRE.

CLARE. A maritime county (capital, Ennis) of Munster, Irish Free State, between Galway Bay and the Shannon estuary; area, 787,768 acres, of which 140,000 are under tillage. The surface is irregular, rising in many places into mountains of considerable elevation, particularly in the east, west, and north-west districts. Oats, potatoes, wheat, and barley are the principal crops. The chief minerals are limestone, lead, and slate, but the produce of the county is almost wholly agricultural. Lakes are numerous, but generally of small size, and the county is deficient in wood. The condition of the smaller cottiers is extremely bad. The salmon-fisheries are valuable, and there are immense oyster-beds in some places. Pop. in 1841, 286,394; in 1891, 123,859; in 1901, 112,129; in 1911, 104,232; in 1926, 95,064.

CLARE, Earl of. English title. The last peer of the earlier creation was killed at Bannockburn in 1314. In 1564 John Holles was made Earl of Clare and his descendants held the title until 1711. From 1711 to 1768 it was held by Thomas Pelham, Duke of Newcastle, the Prime Minister who was related to the Holles family.

In 1795 John Fitzgibbon was made Earl of Clare. He was a barrister and a member of the Irish Parliament. Having been Attorney-General, he was made Lord Chancellor of Ireland in 1789, and helped to bring about the union of the British and Irish Parliaments in 1800. He died Jan. 28, 1802, and his title became extinct in 1864.

The Earls of Clare are perpetuated in several ways. Clare College, Cambridge, owes its name to Elizabeth, a sister of Gilbert, Earl of Clare, who gave money to it in the fourteenth century. Clare Market in the Strand, London, which existed until almost the end of the nineteenth century, was founded about 1657 by John Holles, Earl of Clare.

CLARE, John. "The Northamptonshire peasant poet," born in 1793 at Helpstone, near Peterborough, where his father was a farm labourer. He led a rambling, unsteady life until 1818, when he was obliged to accept parish relief. In 1820 his *Poems Descriptive of Rural Life and Scenery* met with a favourable reception, and the issue of his *Village Minstrel* in 1821 won him many friends. A subscription furnishing him with £45 annually was, however, dissipated by 1823, and his *Shepherd's Calendar* (1827), which he hawked himself, was not a success. He brought out a new work, *The Rural Muse*, in 1835, but became insane shortly afterwards, the remainder of his life, from 1837 to

1864, being passed in the Northampton Lunatic Asylum. Clare was a genuine poet, and his pictures of rural life are eminently truthful and pleasing.—Cf. J. L. Cherry, *Life and Remains of John Clare*.

CLARE COLLEGE. A college of the University of Cambridge, founded in 1326 by Elizabeth, sister of the Earl of Clare. It was known as Clare Hall until 1856, when it became a college. "Soler Halle," from whence came the two heroes of Chaucer's *Reeve's Tale*, has been identified with this college. It has much-admired buildings in the Renaissance style.

CLARE ISLAND. An island of Ireland, County Mayo, situated at the entrance to Clew Bay; length, 4½ miles; breadth, 2 miles. It has a lofty lighthouse.

CLA'RENCE, George, Duke of. Son of Richard, Duke of York, and brother of Edward IV., King of England. On his brother's accession, in 1461, he was created Duke of Clarence, and in 1462 was appointed Lord-Lieutenant of Ireland, but afterwards joined the disaffected Warwick, and married his daughter. On the eve of battle he rejoined his brother, and was afterwards involved in a quarrel with his brother Richard, who had married Warwick's younger daughter, about the inheritance of their father-in-law.

On the death of his wife Clarence sought the hand of Mary of Burgundy, but Edward interposed and a serious breach ensued. A gentleman of the household of Clarence having at this time been condemned for using necromancy against the king, Clarence interfered with the execution of the sentence. He was impeached by the king in person, condemned in 1478, and secretly made away with in the Tower. The tradition that he was drowned in a butt of malmsey wine is unsupported by evidence.—Cf. C. W. C. Oman, *Warwick the Kingmaker*.

CLARENDON CODE. Four laws passed between 1661 and 1665, so-called because the Earl of Clarendon was then the chief adviser of Charles II. Intended to strengthen the position of the Church of England, the laws were as follows: (1) The Corporation Act of 1661, by which every member of a municipal corporation must take the sacrament according to the rites of the Church of England at least once a year. (2) The Act of Uniformity of 1662, which made it necessary for all clergymen to be ordained by a bishop and to use the Prayer Book. (3) The Conventicle Act of 1664, which made all religious services, except those of the Church of England, illegal. (4) The Five Mile Act, which forbade all expelled clergymen to live within 5 miles of a corporate town, unless they had taken an oath to be loyal to the established order.

CLAR'ENDON, Constitutions of. A code of laws adopted in the tenth year of Henry II. (Jan., 1164), at a council of prelates and barons held at the village of Clarendon, Wiltshire. These laws, which were finally digested into sixteen articles, were brought forward by the king as "the ancient customs of the realm," and were enacted as such by the council, but they really involved a great scheme of administrative reform in the assertion of the supremacy of the State over clergy and laity alike. The power of the ecclesiastical courts was restricted, the Crown secured the right of interference in elections to ecclesiastical offices, appeals to Rome were made dependent on the king's leave, ecclesiastical dignitaries were deprived of their freedom to leave the country without the royal permission, etc. Becket signed them, but retracted his signature on the refusal of the Pope Alexander III. to countenance them.

Becket's murder followed, and to effect a reconciliation with the Pope, Henry promised the amendment of the Constitutions of Clarendon. They were accordingly modified in 1176 at Northampton in favour of the Church, but they are not the less to be regarded as containing the germ of the ecclesiastical policy of Henry VIII.—BIBLIOGRAPHY: W. Stubbs, *The Constitutional History of England*; F. W. Maitland, *Roman Canon Law in the Church of England*.

CLAR'ENDON, Edward Hyde, Earl of. Lord High Chancellor of England, born in 1609, died in 1674. He was the son of a private gentleman of Dinton, Wilts, and, after studying at Oxford and at the Middle Temple, he married, in 1629, the daughter of Sir George Ayliffe, and, in 1634, Frances, daughter of Sir Thomas Aylesbury. He commenced his political career in 1640 as member for Wootton-Basset, and was again returned to the Long Parliament (Nov., 1640) by the borough of Saltash, at first acting with the more moderate of the popular party, but gradually separating himself from the democratic movement until, by the autumn of 1641, he was recognized as the real leader of the king's party in the House.

Upon the breaking out of the Civil War he joined the king at York, was knighted, made Privy Councillor, and appointed Chancellor of the Exchequer. After vainly attempting to

bring about a reconciliation between the contending parties he accompanied Prince Charles to Jersey, where he began his *History of the Rebellion*, and wrote answers in the king's name to the manifestoes of the Parliament. In Sept., 1649, he rejoined Charles at the Hague, and was sent by him on an embassy to Madrid. Soon after his return he resumed the business of the exiled court, first at Paris, and afterwards at the Hague, where, in 1657, Charles II. appointed him Lord Chancellor.

After Cromwell's death he contributed more than any other man to promote the Restoration, when he was placed at the head of the English administration. In 1660 he was elected Chancellor of the University of Oxford, and in 1661 was created Baron Hyde, Viscount Cornbury, and Earl of Clarendon. The marriage of the Duke of York with his daughter, Anne Hyde, confirmed for a time his power, but in 1663 Lord Bristol made an unsuccessful attempt to impeach him, his influence with the king declined, and his station as Prime Minister made the nation regard him as answerable for the ill success of the war against Holland, the sale of Dunkirk, etc.

The king's displeasure deepened when his plan of repudiating his wife and marrying the beautiful Lady Stuart was defeated by Clarendon, who effected a marriage between this lady and the Duke of Richmond. The king deprived him of his offices, an impeachment for high treason was commenced against him, and he was compelled to seek refuge in Calais. He lived six years at Montpellier, Moulins, and Rouen, where he died. His body was afterwards removed to Westminster Abbey.

During his second exile he completed his *History of the Rebellion* in autobiographical form, wrote a biographical continuation in defence of his administration, and sought to vindicate Lord Ormonde by a *History of the Rebellion in Ireland*.—BIBLIOGRAPHY: T. H. Lister, *Life and Administration of Edward Hyde*; C. H. Firth, *Edward Hyde, Earl of Clarendon*; G. A. Ellis, *Historical Enquiry Respecting the Character of Edward Hyde*.

CLARENDON, George William Frederick Villiers, fourth Earl of. Born 1800, died 1870. He was the eldest son of the Hon. George Villiers, and through his mother indirectly related to the Hydes, the family of the great Earl of Clarendon. He was educated at Cambridge, entered the civil service at an early age, and in 1820 was attached to the embassy at St. Petersburg (now Leningrad). In 1823 he was appointed to a commissionership of the excise in Dublin. In 1831 he was sent to France to negotiate a commercial treaty, and in 1833, as minister plenipotentiary at Madrid, was instrumental in negotiating the Quadruple Alliance, signed in 1834.

Having succeeded to his uncle's title in 1838, he returned home in the following year, and in Jan., 1840, was appointed Lord Privy Seal, and in October Chancellor of the Duchy of Lancaster. He supported the repeal of the Corn Laws and the reduction of duties, and in 1846 was appointed President of the Board of Trade in Lord J. Russell's ministry, and in the following year Lord-Lieutenant of Ireland. He resigned with his party in 1852, when the Earl of Derby took office, but soon after the formation of the Aberdeen ministry he was appointed to the foreign secretaryship, which he held until Jan., 1855. After a few weeks' interval he returned to the post under Lord Palmerston, and retained it until 1858, being one of the signatories of the Treaty of Paris.

In 1861 Clarendon was sent as ambassador-extraordinary to the coronation of the King of Prussia, and in 1864 was appointed Chancellor of the Duchy of Lancaster. In the following administration, under Russell, he resumed the direction of the Foreign Office. He was sent in 1868 on a special mission to the Pope and the King of Italy, and again occupied the post of Foreign Secretary in the Gladstone ministry till his death in June, 1870.

CLAR'ENDON PRESS. The press of the University of Oxford. In Jan., 1586, delegates *de impressione librorum* were appointed by the Convocation of the university, Joseph Barnes and others after him being styled "Printer to the University." In 1633 Archbishop Laud procured a large licence in printing to the university, with a view to the publication of Bodleian MSS., the work being carried on first in hired premises; then from 1669 in the Sheldonian Theatre; from 1713 to 1830 in the building known as the Clarendon (partly built with the profits derived from Clarendon's *History*), and then in premises specially built to give additional accommodation.

The management of the printing-office is committed to a delegacy consisting of the vice-chancellor and ten other members of Convocation, nominated by the vice-chancellor and proctors, five for life and five for seven years. The north side of the present building, called the "learned" or classical side, is set apart for the

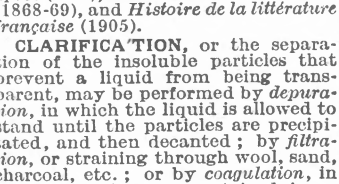
printing of university documents and authorized books, the south for the printing of Bibles and Prayer Books.

CLAR'ET. *See* BORDELAIS WINES.

CLARETIE, Jules (Arséne Arnaud). French author, born at Limoges in 1840, died 1919. Educated at the Lycée Bonaparte, Paris, he soon became known as a dramatic critic. He acted as correspondent for Parisian papers during the Franco-Prussian War. His first play, *La Famille des Gueux* (1869), was a failure, but he was successful with *Le Prince Zilah*, presented in 1885. In the same year he was appointed Director of the Comédie Française, a post which he occupied until his death. In 1888 he was elected to the Académie Française. His publications include: *L'Assassin* (1866), *Puyjoli* (1890), *L'Accusateur* (1897), *Histoire de la Révolution de 1870-71* (5 vols., 1875-76), *Cinq ans après* (*1876*), *La vie moderne au théâtre* (1868-69), and *Histoire de la littérature française* (1905).

CLARIFICA'TION, or the separation of the insoluble particles that prevent a liquid from being transparent, may be performed by *depuration*, in which the liquid is allowed to stand until the particles are precipitated, and then decanted; by *filtration*, or straining through wool, sand, charcoal, etc.; or by *coagulation*, in which the albumen contained in or added to the liquid is solidified and precipitated by the action either of heat or of acids, the extraneous substances being precipitated with it. *See* FINING.

CLAR'INET, or **CLARIONET.** A wind-instrument of the reed kind, played by holes and keys. Its lowest



Clarinet

note is E below the F clef, from which it is capable, in the hands of good performers, of ascending more than three octaves. Clarinets in A natural and B flat are those chiefly used in the orchestra, while instruments in B flat and E flat are used in reed bands.

CLAR'ION. A musical instrument of the trumpet kind, with a narrower tube and a higher and shriller tone than the common trumpet.

CLARK, Sir James, Bart. British physician, born in Banffshire in 1788, died in 1870. After taking his arts degree at Aberdeen he studied medicine at Edinburgh, served in the navy as surgeon from 1809 till 1815, when he returned to Edinburgh. He took his degree of M.D. in 1817, practised in Rome from 1818 to 1826, returned to England in 1826, became physician to the Duchess of Kent in 1835, and on the accession of Queen Victoria was appointed first physician in ordinary to the queen, and shortly afterwards made a baronet. His chief works were *The Influence of Climate in the Prevention and Cure of Chronic Diseases*, and a *Treatise on Pulmonary Consumption*.

CLARK, Latimer. English engineer, born 1822, died 1898; began life as a chemist, but soon took to railway engineering and electric telegraph work; was much employed in connection with the laying of cables and other forms of engineering, including canals, floating docks, etc. He invented the "double-cap invert" insulator and the Clark cell.

CLARKE, Adam. Methodist divine and scholar, born in 1762 in County Londonderry, Ireland. He became an itinerant Methodist preacher, and continued to travel in various circuits till 1805, after which he resided chiefly in London, dying of cholera at Bayswater in 1832. He studied Oriental languages, and published a *Commentary on the Scriptures* (1810-26), a *Bibliographical Dictionary*, and other works.

CLARKE, Charles Cowden. English writer, born at Enfield, Middlesex, in 1787, died in 1877. He was one of the minor members of the Shelley, Keats, and Leigh Hunt group. His publications include his *Hundred Wonders* (1814), *Adam the Gardener* (1834), *Shakespeare Characters* (1863), and *Molière Characters* (1865). He is best known, however, by the edition of Shakespeare which he annotated in conjunction with his wife, and by *The Shakespeare Key* (1879).

CLARKE, Edward Daniel. English traveller and mineralogist, born in Sussex in 1769, died in 1822. He entered Jesus College, Cambridge, in 1786, and was made a fellow in 1798. In 1799 he set out on an extensive tour through Europe, Asia Minor, Syria and Egypt, securing for English institutions many valuable objects, such as the celebrated manuscript of Plato's works, with nearly 100 others, a colossal statue of the Greek goddess Demeter (Ceres), and the famous sarcophagus of Alexander the Great. In 1807 he commenced a course of

lectures on mineralogy at Cambridge, and in 1808 was appointed to the professorship of mineralogy, then first instituted. A complete edition of his works appeared between 1819 and 1824, under the title of *Travels in Various Countries of Europe, Asia, and Africa.*

CLARKE, Sir Edward George. British lawyer, born 15th Feb., 1841. He was educated at various London schools, and attended evening classes at King's College, London. He was for a short time a writer in the India Office; he was called to the Bar in 1864. He made a great reputation by his handling of the Penge murder case (1877) and by his defence of Mrs. Bartlett (1886). He became Q.C. in 1880, and was Solicitor-General from 1886 to 1892. A Conservative in politics, he disagreed with the South African policy of his party in 1899, and resigned his seat; he was re-elected in 1906, but again disagreed with his party on the fiscal question. He published an autobiography, *The Story of my Life*, in 1918. He died 26th April, 1931.

CLARKE, Samuel, D.D. An English theological and philosophical writer, born in 1675 at Norwich, where his father was an alderman, died in 1729. He was educated at Caius College, Cambridge, became chaplain to Dr. More, Bishop of Norwich, and between 1699 and 1701 published *Essays on Baptism, Confirmation, and Repentance*, replied to Toland's *Amyntor*, and issued a paraphrase of the Gospels.

He was then presented to two livings, and in 1704 and 1705 twice delivered the Boyle lectures at Oxford on *The Being and Attributes of God*, and on *The Evidences of Natural and Revealed Religion*. In 1706 he published a letter to Dr. Dodwell on the *Immortality of the Soul*, and a Latin version of Newton's *Optics*. He was then appointed rector of St. Bennet's, London, and shortly afterwards rector of St. James's and chaplain to Queen Anne.

In 1712 he edited Cæsar's *Commentaries*, and published his *Scripture Doctrine of the Trinity*, which became a subject of much controversy and of complaint in the Lower House of Convocation. His chief subsequent productions were his discussions with Leibnitz and Collins on the freedom of the will, his Latin version of part of the *Iliad*, and a considerable number of sermons. His philosophic fame rests on his demonstration of the existence of God, his theory of the nature and obligation of virtue as conformity to certain relations involved in the eternal fitness of things, and his opposition to Hobbes, Spinoza, Locke, Leibnitz, and others.—BIBLIOGRAPHY: Sir L. Stephen, *English Thought in the Eighteenth Century*; H. Sidgwick, *Methods of Ethics.*

CLARKE'S RIVER. A river of the United States, rising in the Rocky Mountains, and, after a winding north-westerly course of about 700 miles, falling into the Columbia, in Washington Territory.

CLARKSON, Thomas. An English emancipationist, born in 1760 at Wisbeach, Cambridgeshire, died in 1846. He was originally intended for the Church, and studied at St. John's College, Cambridge, where he gained the Members' prize for a Latin essay on the theme, *Anne liceat invitos in servitutem dare?* (Is it lawful to make slaves of men against their will?). His researches for this dissertation roused in him a passionate antagonism to the slave-trade, and he allied himself with the Quakers and with Wilberforce.

While the latter advocated the cause in Parliament, Clarkson conducted the agitation throughout England, even crossing to France to obtain the co-operation of the National Convention. His labours went far to secure the prohibition of the slave-trade in 1807, and the Emancipation Act of 1833. His literary works comprise: *A Portraiture of Quakerism* (1806); *History of the Abolition of the Slave Trade* (1808); *Memoirs of William Penn* (1813); *Researches: Antediluvian, Patriarchal, and Historical* (1836); besides numerous pamphlets.

CLA'RY (*Salvia sclarea*). A plant of the Salvia or Sage genus, used for flavouring soups and confectionery.

CLASSIC (a term derived from Lat. *classici*). The name given to the citizens belonging to the first or highest of the six classes into which the Romans were divided. Hence the Greek and Roman authors have been in modern times called *classics*, that is, the excellent, the models. The word now possesses the following meanings: (1) the standard works of any nation; and (2) ancient literature and art, in contradistinction to the modern. A third use of the term, in contradistinction to Romantic, is scarcely comprised under those cited, implying adherence to the established literary or artistic convention of some previous period, as opposed to the insurgence of new elements shaping a new convention. In this sense classic usually implies the predominance of form over emotion and thought, while its antonym Romantic implies the predominance of emotion and the

departure from the old formal standards. *See* ROMANTICISM.

CLASSICAL EDUCATION. Ever since the Revival of Learning, the study of the classics, i.e. of the literatures and the languages of Greece and Rome, formed the basis of education in European schools, colleges, and universities. It has been regarded as the essential part of a liberal education. In the course of time, however, not only in England but also in France, Germany, and other countries, the value and the principles of a classical education were attacked, and discontent with the existing curriculum found expression everywhere. Scientists especially clamoured for a change. They championed the educational claims of science, and demanded an adequate provision for the teaching of science in schools and universities, and the restriction of classical study. The classics, they maintained, should make room for natural and modern studies.

On the other hand, the partisans of a classical education pointed out not only the value of a classical education both in the intellectual and moral provinces, but also the danger to a liberal education which would result from the restriction of the study of Latin and Greek. They rightly argued that only through the study of Latin and Greek could the student gain access to the vast storehouse of wisdom, of experience, and observation accumulated by the master minds of Hellas and Rome in the course of centuries. Greek and Latin may be ancient languages, but they are not dead languages; they are not modern, but they are nevertheless living.

An acquaintance with the literatures of Greece and Rome is an intellectual stimulus and freshens the understanding. By studying these literatures, especially that of Greece, the student comes into contact with truth and nature, for Greek literature deals with those elements of life and human character which are not evanescent but of permanent interest, appealing to every nation and every age.

For the study of grammar and comparative philology the utility of Greek and Latin cannot be denied. "A classical education," wrote Sir Richard Jebb, "helps to preserve sound standards of literature." It is also a splendid preparation for the study of classical art, which is the best humanity has as yet produced. In spite, however, of the many staunch supporters of the study of the classics, innovations have been introduced not only in English but also in continental schools, and there is now a classical and a modern side. Greek, which was a compulsory subject at Oxford and Cambridge till 1919, is now optional in both universities.—BIBLIOGRAPHY: Sir J. E. Sandys, *A Short History of Classical Scholarship*; R. W. Livingstone, *The Greek Genius and its Meaning to Us*; Sir Richard Jebb, *Essays and Addresses*.

CLASSIFICATION. Commonly defined as the arrangement of things, or of our notions of them, according to their resemblances or identities; and its general object is to provide that things shall be thought of in such groups, and the groups in such an order, as will best promote the remembrance and ascertainment of their laws. As any collection of objects may be classified in a variety of ways, no fixed method can be laid down; but it will be obvious that in correct classification the definition of any group must hold exactly true of all the members of that group and not of the members of any other group.

The best classification again will be that which shall enable the greatest possible number of general assertions to be made; a criterion which distinguishes between a natural and an artificial system of classification. Classification is perhaps of most importance in natural history—for example, botany and zoology. In the former the artificial or Linnæan system long prevailed, in opposition to the modern or natural.

CLATHRUS. A genus of Fungi, group Gastromycetes. *C. cancellatus* is a rare British species. The fruit-body is very remarkable, having the form of an oval meshwork or basket, of the colour and appearance of red sealing-wax, and emitting a disgusting putrid odour, highly attractive to the flies which disperse the spores.

CLAUDE (klōd), **Jean.** A French Protestant preacher and professor of the college at Nîmes, born in 1619, died in 1687. He entered into controversy with Arnauld and Bossuet, and on the revocation of the Edict of Nantes took refuge in The Hague, where he died. His chief work was *Défense de la Réformation* (1673).

CLAUDE (klōd), **St.** A town, France, department of the Jura, at the confluence of the Bienne and Tacon. It is the see of a bishop, and has a handsome cathedral and communal college, and a fine promenade along the Bienne. It is celebrated for turnery, hardware, musical-boxes, etc. Pop. 8216.

CLAUDE LORRAINE. A landscape painter whose real name was *Claude Gelée*, but who was called *Lorraine* from the province where he

was born in 1600. According to Baldinucci, when Claude was twelve years old he went to live with his brother, an engraver in wood at Freiburg, went from him to study under Godfrey Waals at Naples, and was afterwards employed at Rome by the painter Agostino Tassi, to grind his colours and do the household drudgery. On leaving Tassi he travelled in Italy, France, and Germany, but settled in 1627 in Rome, where his works were greatly sought after, and where he lived much at his ease until 1682, when he died of the gout.

The pictures painted by Claude number about 400, and the principal galleries of Italy, France, England, Spain, and Germany are adorned with his paintings; that on which he himself set the greatest value being the painting of a small wood belonging to the Villa Madama (Rome). The private collections in England are very rich in specimens of his art. He excelled in luminous atmospheric effects, of which he made elaborate studies. His figure work, however, was inferior, and the figures in many of his paintings were supplied by Lauri and Francesco Allegrini. He made small copies of all his pictures in six books known as *Libri di Verità* (Books of Truth), which form a work of great value (usually called the *Liber Veritatis*), and much esteemed by students.—Cf. J. Ruskin, *Modern Painters*.

CLAUDIA'NUS, Claudius (commonly called Claudian). A Latin poet, native of Alexandria, lived at the end of the fourth and beginning of the fifth century after Christ, under the Emperor Theodosius and his sons. He did much to recall to dying Rome the splendours of the Augustan literature, ranking considerably above any other of the later poets. Besides several panegyrical poems on Honorius, Stilicho, and others, we possess two of his epic poems, *The Rape of Proserpine*, and an unfinished *War of the Giants*, eclogues, epigrams, and occasional poems.

CLAU'DIUS (often also called **CLODIUS**). The name of a distinguished Roman family of antiquity. *See* APPIUS CLAUDIUS.

CLAU'DIUS, or, in full, **TIBERIUS CLAUDIUS DRUSUS NERO GERMANICUS.** A Roman emperor, son of Claudius Drusus Nero, stepson of Augustus and Antonia, the daughter of Augustus' sister; born at Lyons (10 B.C.). He lived in privacy, occupying himself with literature, the composition of a Roman history, and other works, until the murder of Caligula, when he was dragged from his hiding-place and proclaimed emperor (A.D. 41). The early years of his reign were marked by the restoration of the exiles, the embellishment of Rome, the addition of Mauritania to the Roman provinces, and successes in Germany and Britain. But afterwards he became debauched, left the government to his wives, and in particular to Messalina, who with his freedmen committed the greatest enormities. He was poisoned by his fourth wife, Agrippina (mother of Nero), A.D. 54.

CLAUDIUS, Matthias. A German poet, known by the psuedonym of *Asmus*, born in 1740 near Lübeck. His works, which are on a great variety of subjects, are all of a popular character, and many of his songs have become a part of the national melodies. In later life he became a convert to religious mysticism, and died at Hamburg in 1815, after having filled several public offices.

CLAUSENBURG. *See* KLAUSENBURG.

CLAUSIUS, Rudolf Julius Emmanuel. German physicist, born in 1822, died 1888. He was one of the founders of the modern science of thermo-dynamics (q.v.). His researches in heat, molecular physics, and electricity are very valuable. In 1850 he stated the second law of thermodynamics, namely "that heat cannot of itself pass from a colder to a hotter body." He was a foreign member of the Royal Society, and was awarded its highest honour, the Copley medal, in 1879. He wrote, among other works: *Die mechanische Wärmetheorie* and *Die Potentialfunktion und das Potential*.

CLAUSTHAL. *See* KLAUSTHAL.

CLAVA'RIA. A genus of Hymenomycetes, some species of which are edible. The fruit-body is club-shaped or cylindrical, often much branched, and usually whitish or yellow in colour; the whole outer surface is occupied by the hymenium.

CLAVERHOUSE. *See* GRAHAM, JOHN.

CLAVICEPS. *See* ERGOT.

CLAV'ICHORD, or **CLAR'ICHORD.** An old keyed instrument, somewhat in the form of a spinet. The strings, which were supported by five bridges, were covered with pieces of cloth which deadened the tone, but rendered it sweeter. It was sometimes called the *dumb spinet*.

CLAV'ICLE (Lat. *Clavicula*, little key), the collar-bone, a bone forming one of the elements of the shoulder girdle in vertebrate animals. In man and most mammals there are two

clavicles, each joined at one end to the scapula or shoulder-bone, and at the other end to the sternum or breast-bone.

CLAVICORN BEETLES (*Clavicornes*). A large group of coleopterous insects, distinguished by the club-shaped character of the antennæ. Burying-beetles and bacon-beetles are typical examples, and there are aquatic as well as terrestrial species.

CLAVIGERO (klä-vi-hä'rō), **Francesco Saverio.** A Spanish historian, born at Vera Cruz, Mexico, in 1720, died in 1787. He was educated as an ecclesiastic, and resided thirty-six years in the provinces of New Spain, where he acquired the languages of the Mexicans and other indigenous nations, collected many of their traditions, and studied their historical paintings and other monuments of antiquity. On the suppression of the Jesuits by the Spanish Government in 1767 Clavigero went to Italy, the Pope assigning him a residence in Cesena, where he wrote his Mexican history (*Historia antica del Messico*), translated into English by Cullen in 1787.

CLAY. A term popularly used for a mineral mass or rock which becomes distinctly sticky when wet, and which, when it contains a certain amount of moisture, clings to any surface presented to it. Very fine sand answers this description; but it falls to powder when dry, while true clay shrinks on drying into a tough mass broken by cracks.

The characteristics of clay are, indeed, fundamentally a question of mineral constitution as well as of fine grain and the consequent large grain-surface. Minutely divided plates of kaolin, mica, and chlorite constitute the typical rock. Plasticity, or the power of retaining on drying a form imparted to it when wet, is a property of the most typical and stiff clays, but not of all the materials that would popularly be styled clay. There is almost always an excess of silica in clays over that required for the mineral kaolin, though some of the best plastic clays approximate closely to kaolin earths. The extra silica is due to the presence of fine quartz sand and to particles of felspar.

Porcelain clay, the rock-form of *kaolin*, or *china clay*, is a pure white clay derived from the decay of alkali-felspars in granite. It is essentially hydrous aluminium silicate, with some 47 per cent. of silica. *Potter's clay* and *pipe-clay* are almost as pure, though pipes have been made from matter far more rich in silica. *Fire-clay* is a refractory type, owing to the absence of fusible compounds. *Loam* is a sandy clay, the sand lightening the clay for ploughing; *marl* is calcareous clay, and effervesces with acids. *Bole* (q.v.) is a ferruginous clay; *lithomarge* and the *ochres* are similar.

The nature of clay soils has been closely studied in connection with the determination of the sizes of soil-grains and the effect of "soil-grade" on drainage, on difficulty of working, and so forth. The relative abundance of particles less than 0·002 mm. (two microns) in diameter is an important factor in the "clayiness" of a soil, since these particles keep apart from one another, do not sink, and maintain the soil-solution in a permanently turbid condition. Liming the soil allows these particles to gather together into composite grains, and thus lightens the whole mass.

The clay particles in a soil, since they present a large grain-surface, and also probably in virtue of special chemical properties, are capable of absorbing or adsorbing material such as ammonia, phosphoric oxide, and potash, from the soil-solution, and thus prevent them from being lost in drainage. Some agricultural investigators appropriate the term clay to the material of the finest grade only. Few crops can be said to flourish on truly clayey soils, though wheat and tobacco require heavier soils than barley. Much clay land is in consequence given over to permanent pasture. Cf. A. B. Searle, *Natural History of Clay* (Cambridge Manuals of Science and Literature).

CLAY, Henry. An American statesman, born at Richmond, Virginia, in 1777, died at Washington in 1852. After acting as clerk in two or three State offices he commenced business in 1797 as a lawyer at Lexington, Kentucky. He soon became famous as a public speaker, and at the age of twenty-six was a member of the Kentucky legislature. In 1806 he was elected to the United States Senate; and in 1811 to the House of Representatives, where he was at once made Speaker. In 1814 he proceeded to Europe, and acted as one of the commissioners for adjusting the treaty of peace at Ghent between America and Great Britain. He was an unsuccessful candidate for the presidency in 1824, 1832, and 1844.

He is best known for his endeavours to shut out European influences from America, and in connection with the "Missouri Compromise" of 1820, restricting slavery to the states south of lat. 36° 30′ N.; and another similar compromise of 1850 regarding the admission of California, New Mexico,

and Utah.—Cf. Carl Schurz, *Henry Clay* (American Statesmen Series).

CLAYCROSS. A town of England, in Derbyshire, 5 miles S. of Chesterfield, in a coal and iron district. Pop. (1931), 8493.

CLAYMORE. Formerly the large two-handed, double-edged sword of the Scottish Highlanders; now a basket-hilted, double-edged broadsword.

CLAYTON WEST. A town of England, W. Riding, Yorks., 3 miles S.W. of Bradford, engaged in the worsted manufacture. Pop. (1931), 1846.

CLAYTON-BULWER TREATY. A treaty between Britain and the United States concluded in 1850, and having reference to the construction of a ship canal across the Isthmus of Panama. Both parties agreed not to erect fortifications there, nor to acquire any part of the Central American territory. It was modified and practically abrogated by the Hay-Pauncefote Treaty in 1902, which adopted the policy of neutralization for the Panama Canal.

CLAYTON-LE-MOORS. A town of England, in the north-east of Lancashire, 4½ miles N.E. of Blackburn, with calico-printing and other works. Pop. (1931), 7910.

CLEANING-MACHINES. Mechanical appliances for cleansing various substances have been long known to the farmer, industrial worker, and housewife. In agriculture implements are employed which "clean" the land; while chaff and straw are removed from grain by threshing and winnowing machines, and the value of various crops improved by contrivances which sift out small, inferior grains.

Collieries are equipped with coal-washing apparatus, where, in troughs supplied with running water, small coal, which sinks comparatively slowly, can be separated from the heavier stone and shale.

In domestic life encouragement to the invention and perfecting of labour-saving devices has been increased by the growing difficulty of the servant problem. The mechanical knife-cleaner is well known; while washers and wringers for clothes, some worked by electricity, are frequently in use.

Among machines very popular of late is the carpet-sweeper. This, at first a simple set of brushes which rotated when the box containing them was pushed across the floor, has been superseded by a machine which draws dust from the carpet by pneumatic suction (vacuum cleaner). In large sizes it is actuated by a petrol-engine, and requires manipulation by a skilled operator. Smaller types can be used by a member of the household, are worked by hand or electricity, and are provided with additional fittings adapted for the cleaning of walls, curtains, and upholstered furniture.

CLEAN'THES. A Greek Stoic philosopher, born at Assos 301, died 232 B.C. His original occupation was that of a boxer. He was a disciple of Zeno for nineteen years, and succeeded him in his school. He died of voluntary starvation at the age of eighty. His name is chiefly associated with the theology of the Stoic school, a theology both pantheistic and materialistic. Only some fragments of his works are extant.

CLEAR, Cape. A promontory 400 feet high at the southern extremity of Clear Island, and the most southern point of Ireland, about 7½ miles S.E. of Baltimore, County Cork.—Clear Island is about 3¼ miles long and about 1 broad. It is wild and romantic, and has a fishing population of over 1000.

CLEARANCE OF VESSELS. The examination of them by the proper custom-house officers, and the giving of a certificate that the regulations have been duly complied with. Vessels are said to "enter" inwards or "clear" outwards, according as they arrive or set sail.

CLEARING-HOUSE. An institution where payments, receipts, or claims are adjusted and differences settled, notably in connection with banks and railways. The system has been extended to stock and other exchanges, and has been adopted in many other business operations. In banking it originated in large cities with many banks, the sums due by and to the banks among themselves being set off against each other and the balance paid or received. In London the balance used to be settled in cash or Bank of England notes. Then the principal banks having each its account at the Bank of England, the balances were settled by transfers from one account to another. The other banks "clear" through the "clearing" banks, the country banks through their London agents.

The clearing-house system, first introduced in 1775, is carried out by periodical settlements during the day, for town and country clearing, under the inspection of clearing house officials. The system has been adopted in provincial towns and in all countries.

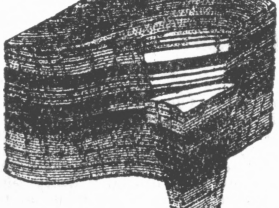
The Railway Clearing-house is an association representative of all the railway companies of the country, with a committee of superintendence, for the adjustment of through traffic, passenger and goods. Thus a passenger can purchase one ticket which will carry him over lines belonging to several companies, and goods are conveyed through without additional booking, fresh entries, and consequent delay. The British Clearing-house, formed in 1842, has statutory authority to settle claims, while other arrangements affecting railway companies or public facilities are agreed upon in association. BIBLIOGRAPHY: J. G. Cannon, *Clearing-houses: their History, Methods, and Administration*; W. Howarth, *Our Clearing System and Clearing-houses*; Jevons, *Money and Mechanism of Exchange.*

CLEARING-NUT (*Strychnos potatorum*). [A small tree of the same genus as the nux vomica, common in Indian forests. Its seeds being rubbed on the inside of a vessel containing turbid water speedily precipitate the impurities, this result being due, it is said, to the clarifying effect of the albumin and casein they contain.

CLEAR-STORY. *See* CLERE-STORY.

CLEATOR MOOR. A town of England, in Cumberland, 4 miles S.E. of Whitehaven, with coal-mines and iron-furnaces. Pop. (1931), 6582.

CLEAVAGE. The manner or direction in which substances regularly cleave or split. The regular



Cleavage in rocks

The horizontal bands show the stratification; the fine lines (nearly vertical) indicate the direction in which the rock "cleaves."

structure of most crystallized bodies becomes manifest as soon as they are broken. Each fragment may present the form of a small polyhedron, and the very dust is seen under the microscope to consist of minute solids, regularly terminated. The directions in which such bodies thus break up are called their planes of cleavage, and the cleavage is named from the crystalline plane to which it is parallel.

The directions of the cleavages of a mineral depend upon its fundamental crystalline form, although it is by no means necessary that a plane parallel to the cleavage should be present on the surface. Moreover, all the varied crystalline forms of the same mineral species will, if the property of cleavage is present, cleave in the same directions, and thus a broken fragment is often highly useful in mineral determination. Cleavage in rocks depends on quite other causes, and is a parallel fissile structure induced by pressure and the consequent gliding of mineral particles.

CLEAVERS, CLIVERS, or **GOOSE-GRASS** (*Calium Aparine*). A common species of the bed-straw genus of plants, with hispid stem, leaves, and fruit, common in hedges and among bushes in Britain and other parts of Europe. It is called "cleavers" from the readiness with which it adheres to a person's clothes, thus giving evidence of its adaptation to dispersal by fur- or wool-bearing animals. The leaves are narrow and arranged in whorls, usually eight on each whorl.

CLECKHEATON. A township, England, Yorkshire, West Riding, pleasantly situated on a declivity in the Spen valley, 9 miles W. of Leeds. The industries include the worsted and machine-card trades, machine-making, engineering works, etc. It is in Spenborough urban district.

CLEEF (klāf). 1. **Joseph van,** surnamed *the Fool*, born at Antwerp in 1480, one of the most celebrated painters of his time, who in regard to beauty of colouring may challenge comparison with the Italian masters. He died insane in 1529. 2. **John,** a painter, born at Rome in 1646, belongs to the Flemish school, of which he is one of the most eminent masters. His works show more breadth of style than skill in colouring. He died in 1716.

CLEE HILLS. A group of English hills in Shropshire, west of the Severn and north of the Teme, rising in the Brown Clee to the height of 1792 feet; there are quarries and collieries there.

CLEETHORPES. A watering-place of England, on the Lincolnshire coast, a short distance south-east of Grimsby, with public gardens, pier, sea-wall, and promenade. Pop. (urban district), (1931), 28,624.

CLEF (French for key, from the Lat. *clavis*). In music, a sign placed on a line of a staff, and which determines

the pitch of the staff and the name of the note on its lines. There are three clefs now in use: the *treble* or G clef, written on the second line; the *mean* or C clef, which may be placed on the first, second, third, or fourth lines; and the *bass* or F clef, seated on the fourth line. The mean clef is very seldom used in writing vocal music in England.

CLEG, or CLEGG. A name applied to blood-sucking flies belonging to the family Tabanidæ. Such are the great horse-fly, gad-fly, or breeze (*Tabānus bovīnus*), the *Chrysops cæcutiens*, and the *Hæmatopōta pluviālis*).

CLEISTOGAMY. The production of flowers which never open and are therefore necessarily self-pollinated. Examples from the British flora are dog-violet and wood-sorrel. Cleistogamous plants produce normal (*chasmogamous*) flowers as well, the cleistogamous ones appearing late in the season. In cleistogamy the advantages of cross-fertilization are sacrificed for the certainty of setting sufficient seed to perpetuate the species.

CLEM'ATIS. A large genus of woody leaf-climbers, comprising over 150 species, of the ord. Ranunculaceæ. The most common species, *C. Vitalba*, virgin's bower or traveller's joy, is conspicuous in the hedges both of England and the south of Scotland, first by its copious clusters of white blossoms, and afterwards by its feathery styles attached to the fruits. Among the exotic species in greatest favour with horticulturists are *C. flammŭla*, which produces abundant panicles of small white flowers, and has a fine perfume; *C. cirrhōsa*, remarkable for its large greenish-white flowers; and *C. viticella*, with its festooning branches adorned with pink or purple bells. *C. virginiana* is an American species, known by the same name as the English; *C. Jackmanni* is a well-known garden hybrid. The fruit and leaves of the common clematis are acrid and vesicant.

CLEMENCEAU, Georges Benjamin Eugène. French statesman and journalist, born at Château de l'Aubraie, in Vendée, on 28th Sept., 1841. Educated to be a physician, he early drifted into politics, carried away by the republicanism of the time, and gave up the medical profession. In 1866 he went to England and the United States, where he earned his living by writing for the press and teaching French in a girls' school. Subsequently he married an American lady, Miss Mary Plummer. Returning to Paris in 1870, he became Mayor of Montmartre, was elected to the National Assembly at Bordeaux, where he voted against the peace preliminaries with Prussia. Elected to the Chamber of Deputies in 1876, he retained his seat till 1893.

He soon attracted public attention through his independent action, his caustic and brilliant oratory, and his pithy utterances. His firmness, hatred of compromise, and bitterness against the spirit of opportunism were such that he was styled—not undeservedly—a Jacobin. Whether popular or attacked, whether in office

Clemenceau

or out of it, Clemenceau always kept in the forefront of the political arena. He won the nickname of the "Tiger" on account of his powerful invective and attacks upon the Government.

In 1880 he founded a daily paper, *La Justice*, of which he became principal editor. A staunch and ardent Republican, he deserted the cause of General Boulanger, whom he had at first supported, when he discovered that the general was plotting to overthrow the Republic and to set up a monarchy.

In 1893 he lost his seat in the Chamber, in consequence of the Panama scandal, and for ten years expressed himself through the medium of the press. A lover of justice, he championed the cause of Captain Dreyfus in his paper *L'Aurore*. Elected Senator for the Var

department in 1903, he became Minister of the Interior in 1906, and shortly afterwards succeeded Sarrien as Premier, remaining in office till 1909.

During the European War he constantly attacked the Government, both in the Senate and in his paper *L'Homme Libre*, which he called for a time *L'Homme Enchaîné*. He bitterly criticized the delays of ministers in prosecuting the war and in dealing either with supplies or defeatism. As the war proceeded, and France was more than once in a critical position, the public gradually began to look upon Clemenceau as the only strong man capable of saving the country. At last President Poincaré, in spite of the personal disagreement which had existed between him and the Senator of the Var, invited his former opponent to form a ministry.

Clemenceau became Premier in Nov., 1917, and, at once displaying his characteristic energy, carried the war to a successful issue, and presided at the Peace Conference in Paris which resulted in the Treaty of Versailles. During the Commune Clemenceau had nearly lost his life, and on 19th Feb., 1919, he was shot at by an anarchist, Émile Cottin, but the attempt on the Premier's life failed. He reigned office in Jan., 1920, was nominated for the presidency of the Republic, but withdrew his candidature, Paul Deschanel (who resigned in Sept., 1920), being elected instead.

Having resigned his seat in the Senate, Clemenceau went for a long tour abroad, travelling in Egypt and India, and returning to France in March, 1921. He died 24th Nov., 1929. His works include *La Mêlée Sociale* (1894); *Le Grand Pan* (1895); *Le Plus Forts* (1898); *L'Iniquité* (1899); *L'Eglise, La République et la Liberté* (1903); *La France devant l'Allemagne* (1916); *Au pied du Sinaï* (1920).—BIBLIOGRAPHY: J. M'Cabe, *France's Grand Old Man*; H. M. Hyndman, *Clemenceau: the Man and his Time*; C. Ducray, *Clemenceau: Writer, Citizen, Statesman.*

CLEM'ENS, Samuel Langhorne. An American humorist, well known by his pseudonym *Mark Twain*, born in Missouri in 1835, died in 1910. He worked for some time as a compositor in Philadelphia and New York, and then in 1855 learned the business of pilot on the Mississippi. Thence he went to the Nevada mines; became in 1862 local editor of a newspaper in Virginia City; went to San Francisco; was for some time a reporter, and worked in the Calaveras gold-diggings. In 1866 he went to the Sandwich Islands, and on his return commenced his lecturing career. He edited for a time a paper in Buffalo, and finally married and settled in Hartford, Conn.

His chief books are: *The Jumping Frog, etc.* (1867), *Roughing It* (1873), *The Innocents Abroad* (1869), *Tom Sawyer* (1876), *A Tramp Abroad* (1880), *Life on the Mississippi* (1883), *Huckleberry Finn* (1885), *American Claimant* (1892), *Tom Sawyer Abroad* (1893), *The Man that Corrupted Hadleyburg* (1900), *Christian Science* (1903), *A Dog's Tale* (1904), *Eve's Diary* (1906).—Cf. A. Henderson, *Mark Twain.*

CLEM'ENT. The name assumed by many Popes, the first being Clement of Rome (*see* article below). *Clement XIV.*, who abolished the order of Jesuits, was one of the most distinguished. He died in 1774.

CLEM'ENT, properly **TITUS FLAVIUS CLEMENS,** commonly known as *Clement of Alexandria*. One of the most famous teachers of the Christian Church in the second and at the beginning of the third century. He was converted from paganism to Christianity, and after travelling in Greece, Italy, and the East, became presbyter of the Church of Alexandria, and teacher in the celebrated school in that city, in which place he succeeded Pantænus, his teacher, and was succeeded by Origen, his pupil.

His chief remaining works are the *Protreptikos*, *Paidagōgos*, and *Strōmateis* (Patchwork); the first an exhortation to the Greeks to turn to the one true God, the second a work on Christ, the last a collection of brief discursions in chronology, philosophy, and poetry. Few of the early Christians had so wide a knowledge of Greek philosophy and literature, and it is as a higher philosophic scheme that he mainly discusses Christianity. He was regarded as a saint until Benedict XIV. struck him off the calendar.—Cf. F. R. M. Hitchcock, *Clement of Alexandria.*

CLEMENT, Clemens Romanus, or **CLEMENT OF ROME.** One of the "Apostolic Fathers," is said to have been the second or the third successor of Peter as Bishop of Rome, and the first of the numerous Popes named Clement. He is perhaps identical with the consul Flavius Clemens, put to death under Domitian A.D. 95. Various writings are attributed to him, but the only one that can be regarded as possibly genuine is an *Epistle to the Corinthians*, first obtained in a complete form in 1875. It is of importance as exhibiting the first attempt of the Church of Rome to exercise ecclesiastical authority over other Churches.

CLÉMENT (klā-măn), **Jacques.** The assassin of Henry III. of France, born in 1567, became a Dominican, and the fanatical tool of the Ducs de Mayenne and d'Aumale, and the Duchesse Montpensier. Having fatally stabbed the king on 1st Aug., 1589, he was at once killed by the courtiers; but the populace, at the instigation of the priests, regarded him as a martyr; and Pope Sixtus V. even pronounced his panegyric.

CLEMEN'TI, Muzio. Pianist and composer, born in Rome in 1752. As early as his twelfth year he wrote a successful mass for four voices, and had made such progress in the pianoforte that Beckford (the author of *Vathek*) took him to England to complete his studies. He was then engaged as director of the orchestra of the opera in London, and, his fame having rapidly increased, he went in 1780 to Paris, and in 1781 to Vienna, where he played with Mozart before the emperor. In 1784 he repeated his visit to Paris, but after that remained in England till 1802, when he went back to the Continent. He returned in 1810 to England, where he settled down as superintendent of one of the principal musical establishments in London. He died on his estate at Evesham in 1832, and was interred in Westminster Abbey.

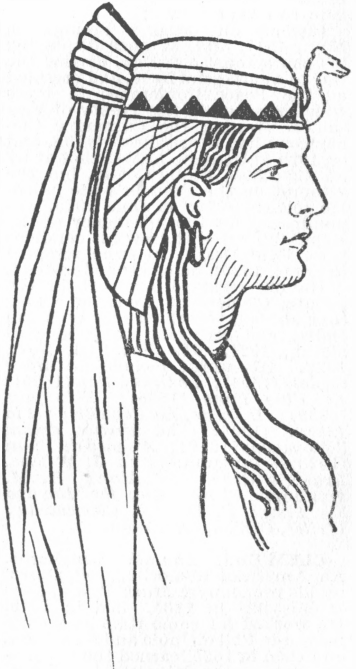
His most important compositions were his sixty sonatas for the pianoforte and the great collection of studies known as the *Gradus ad Parnassum*, a work of high educative value. Whilst Mozart closed the old, Clementi may be said to have founded the newer school of technique, and his influence upon modern execution has led to his being characterized as "the father of pianoforte playing."

CLEOBU'LUS. One of the so-called Seven Sages of ancient Greece, a native of Lindus, who travelled to Egypt to learn wisdom, and became King of Rhodes. He lived about 560 B.C.

CLEOM'ENES (-nēz). The name of three Kings of Sparta, the most distinguished of whom is Cleomenes III., the last of the Heraclidæ, king from 236 to 220 B.C. He intended to reform Sparta and to restore the institutions of Lycurgus, and therefore put to death the ephori, made a new division of lands, introduced again the old Spartan system of education, made his brother his colleague, and extended the franchise. He was defeated by the allied Macedonians and Archæans at the battle of Sellasia (222 B.C.), and fled to Egypt, where he was supported by Ptolemy Euergetes, but was kept in confinement by the succeeding Ptolemy. He escaped and attempted to raise a revolt, but, failing, committed suicide.

CLE'ON. An Athenian demagogue, originally a tanner by trade. He was well known in public before the death of Pericles, and in 427 B.C. distinguished himself by the proposal to put to death the adult males of the revolted Mytileneans and sell the women and children as slaves. In 425 he took Sphacteria from the Spartans; but in 424 and 422 he was violently attacked by Aristophanes in the *Knights* and in the *Wasps*. He was sent, however, in 422 against Brasidas, but allowed himself to be taken unawares, and was slain while attempting to flee.

CLEOPAT'RA. A Greek queen of Egypt, born 69 B.C., the eldest



Cleopatra

daughter of Ptolemy Aulētēs. When she was seventeen her father died, leaving her as joint-heir to the throne with his eldest son Ptolemy, whom she was to marry—such marriages

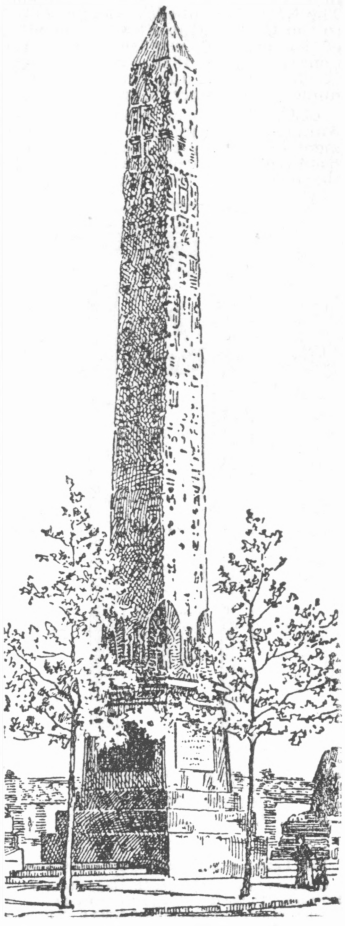
being common among the Ptolemies. Being deprived of her part in the government (49 B.C.), she won Cæsar to her cause, and was reinstated by his influence.

In a second disturbance Ptolemy lost his life, and Cæsar proclaimed Cleopatra Queen of Egypt; though she was compelled to take her brother, the younger Ptolemy, then eleven years old, as husband and colleague. Cæsar continued some time at Cleopatra's court, had a son by her named Cæsarion (afterwards put to death by Augustus), and gave her a magnificent reception when she subsequently visited him at Rome.

By poisoning her brother she remained sole possessor of the regal power, took the part of the *triumviri* in the civil war at Rome, and after the battle of Philippi sailed to join Antony at Tarsus. Their meeting was celebrated by splendid festivals; she accompanied him to Tyre, and was followed by him on her return to Egypt. After his conquest of Armenia he again returned to her, and made his three sons by her, and also Cæsarion, kings. On the commencement of the war between Augustus and Antony the latter lost a whole year in festivals and amusements with Cleopatra at Ephesus, Samos, and Athens, and when at last the fleets met at Actium, Cleopatra suddenly took to flight, with all her ships, and Antony, as if under the influence of frenzy, immediately followed her.

They fled to Egypt, and declared to Augustus that if Egypt were left to Cleopatra's children they would thenceforth live in retirement. Augustus, however, demanded Antony's death, and advanced on Alexandria. Believing Cleopatra, who had taken refuge in her mausoleum, to have killed herself, Antony threw himself on his sword, and shortly afterwards Cleopatra committed suicide by applying an asp to her arm, to escape the ignominy of being led in a Roman triumph (30 B.C.). With her the dynasty of the Ptolemies ended.—BIBLIOGRAPHY: Sir J. P. Mahaffy, *History of Egypt under the Ptolemaic Dynasty*; Stahr, *Cleopâtra*; A. Houssaye, *Aspasie, Cléopâtre*; P. W. Sergeant, *Cleopatra of Egypt*.

CLEOPATRA'S NEEDLES. The name given to two Egyptian obelisks, formerly at Alexandria, but one of which is now in London, the other in New York. They are made of the rose-red granite of Syene, and were originally erected by the Egyptian king Thothmes III. in front of the great temple of Heliopolis, the On of the Scriptures, where Moses was born and brought up. They were taken to Alexandria shortly before the commencement of the Christian era, and after the death of Cleopatra, but



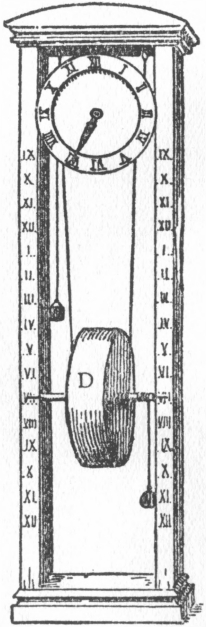
Cleopatra's Needle
Now on the Thames Embankment, London

possibly in pursuance of a design originated by her.

The London obelisk, which stands on the Thames Embankment, was presented to the British Government in 1819, but was long left uncared

for, and remained at Alexandria. In 1878, however, it was brought to London by the private munificence of Sir Erasmus Wilson, and erected in its place at a cost of some £10,000. The New York obelisk was presented to the United States by the Khedive of Egypt, and was set up in the Central Park in 1880. Each is about 70 feet high, and inscribed with numerous hieroglyphics.

CLEP'SYDRA, or WATER-CLOCK. An ancient instrument for the measurement of time by the escape of water from a vessel through an orifice. In the older ones the hours were esti-



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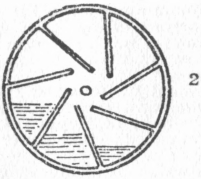
Figs. 1 and 2.—Clepsydra, Seventeenth Century

Consists of an upright wooden stand about 3 feet in height. To the cross-bar at the top are attached a couple of cords which bear the drum D by its axis. The drum contains seven cells (Fig. 2), each pierced with a small hole near the bottom. Water is placed in the drum, which is then pulled up to the top of the frame. The tendency of the drum is to fall, but the water, slowly dripping from one partition to the other, to a certain extent counteracts the force of gravity, and the consequence is that the speed of the descent of the drum may be regulated to a nicety. The axis either shows the hours on the sides of the frame, or by means of a cord with a weight attached to an index, the time can be indicated on a dial.



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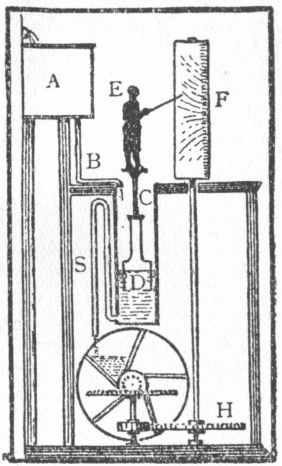

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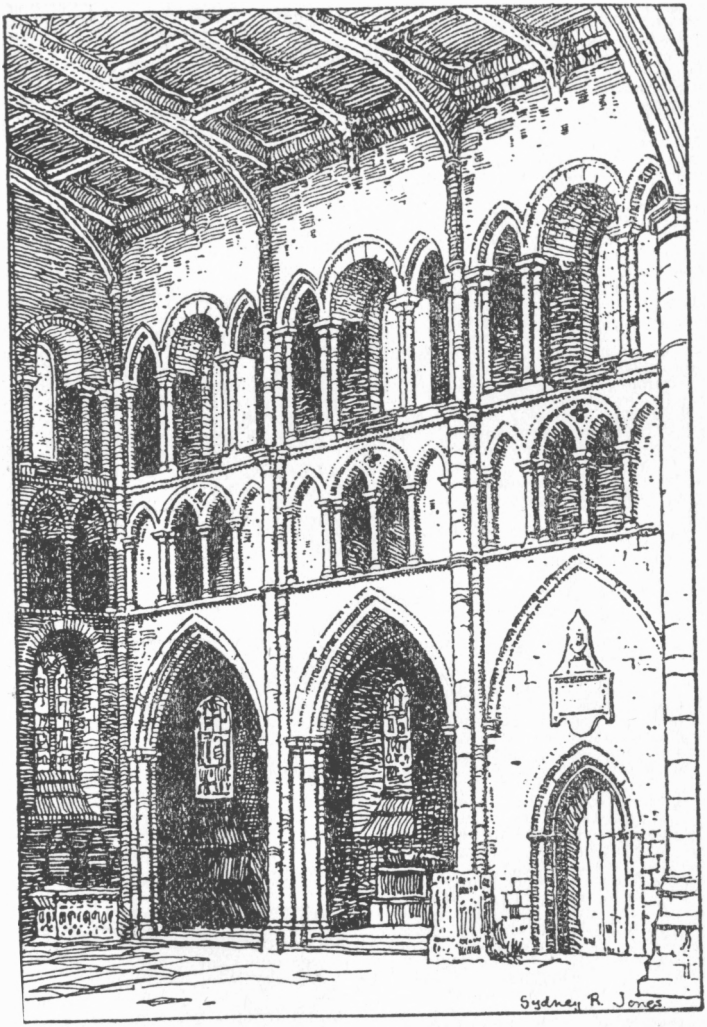
Fig. 3.—Clepsydra of Ctesibus. Form ascribed to the ancient Egyptians

A, Water-supply flows through pipe Q to ope cylinder C, and raises float D and the figure E mad up of thin copper, which points the hours on th column or drum F. The hours engraved on th column are marked in slanting lines, which corre spond with the varying length of the days throughou the year. Water escapes by siphon S, when the floa and figure fall to the bottom of the cylinder, an become ready to rise and register another day. Thu as the figure rises each day, by means of a cogwhe it moves the drum round one division, or the thr hundred and sixty-fifth part of a revolution. Co wheel H contains 365 teeth; one tooth is driven fo ward at the close of each day. A separate scale provided for every day in the year, and these scal are mounted on the drum, which revolves so as turn round once in the year.

mated simply by the sinking of t surface of the water; in others t water surface is connected with dial-plate and hand by a system weights and floats. On water bei admitted from the cistern the flo rises, the counter-weight descen and turns the spindle, which aga turns the hand that marks the hou

CLERE-STORY, or CLEAR-STOR The upper part of the nave in Got



CLERE-STORY, RIPON CATHEDRAL
Above the arches of the transept is the triforium, above which is the clere-story.

churches, above the triforium where a triforium is present, and formed by walls supported on the arches of the nave, and rising above the roof of the side aisles. In these walls windows are inserted for the purpose of increasing the light in the nave.

CLERGY (from Gr. *klēros*, a lot, through the Lat. *clericus* and L.Lat. *clericia*). The body of ecclesiastical persons, in contradistinction to the *laity*. The Greek word came into use to indicate that this class was to be considered as the particular inheritance and property of God, or else, which is more probable, because it was customary to select by lot those set apart for special religious functions. At first there was no strongly marked distinction between clergy and laity, but the former soon drew apart, consisting, after the apostolic age, of bishops, priests, and deacons, and in the fourth century of many additional inferior orders, such as subdeacons, acolytes, etc.

With the increased complexity of the hierarchy there was a steady accretion of privileges until the burden of these became intolerable to the laity. In England few of these now remain, the clergy being generally regarded as invested with no inherent claim to consideration. A clergyman cannot, however, be compelled to serve as juryman; he is exempted from arrest while celebrating divine worship, from acting as bailiff, constable, or like office, from attendance at a court leet; but on the other hand he cannot accept a seat in the House of Commons, engage in trade, or farm lands of more than eighty acres without his bishop's consent.

The Episcopalians recognize three classes of clergy—bishops, priests, and deacons—and generally hold the doctrine of the apostolic succession. Large numbers of Protestants, however, reject this dogma, and believe in the ministry of only one order. The Catholic clergyman, according to the doctrine of the Roman Catholic Church, is endowed in his spiritual character with a supernatural power, which distinguishes him essentially from the layman. *Regular* clergy are those who live according to monastic rule, *secular* clergy those who do not. —BIBLIOGRAPHY: J. Keatinge, *The Priest: his Character and Work*; A. J. Mason, *The Church of England and Episcopacy*; C. D. Plater, *The Priest and Social Action*; J. H. B. Masterman, *Clerical Incomes*.

CLERGY, Benefit of. *See* BENEFIT OF CLERGY.

CLERGY DISCIPLINE ACT. An English Act passed in 1892, directed against immoral acts or conduct on the part of the clergy, facilitating procedure against offenders, and rendering deprivation of a benefice easy in the case of convicted persons, but not dealing with offences connected with doctrine or ritual, which come under the Public Worship Regulation Act of 1874.

CLERK, John (of Eldin, near Edinburgh). Born 1728, died 1812, a naval tactician, for whom is claimed the invention of the manœuvre of *breaking the enemy's line*, put forth in an *Essay on Naval Tactics* published in 1790, afterwards employed with signal effect by Howe, St. Vincent, Duncan, and Nelson. His son John, Lord Eldin, born 1757, died 1832, was a distinguished Scottish judge.

CLERK, Parish. A lay officer of the Church of England, appointed either by the incumbent or the parishioners. It is his duty to lead the responses and assist in public worship, at funerals, and on other occasions.

CLERKE, Agnes Mary. British astronomer, born in Ireland in 1842, died 1907. She made astronomical observations in South Africa in 1888, and in the Baltic Sea in 1890. In 1893 she was awarded the Acton prize for her astronomical work. Her works include: *A Popular History of Astronomy* (new edition, 1902), *The Systems of the Stars* (1905), *Problems in Astrophysics* (1903), and *Modern Cosmogonies* (1905).

CLERK OF THE HOUSE OF COMMONS. An officer appointed by the Crown, whose duty it is to make minutes of the decisions of the House (not of the debates); to see that these minutes are correctly printed and handed to the members; to read aloud all such papers as the House may order to be read; and to perform the office of president (without taking the chair) during the choice of a Speaker.

CLERK-MAXWELL, James. *See* MAXWELL.

CLERMONT-DE-LODEVE (klăr-mōn-d-lo-dāv), or **CLERMONT DE L'HÉRAULT** (-d-lā-rō). A town of France, department of Hérault, 23 miles W. by N. of Montpellier. Pop. 5620.

CLERMONT-EN-BEAUVAISIS (klăr-mōn-tăn-bō-vā-sē), or **CLERMONT DE L'OISE** (d-lwäs). A town of France, department of Oise, 17 miles E. by S. of Beauvais. Pop. 5780

CLERMONT-FERRAND (klăr-mōn-fā-răn). A town of France

capital of department of Puy-de-Dôme, on a hill at the foot of the volcanic range in which the summit of the Puy is conspicuous. It possessed considerable importance under the Romans, and became a bishop's see at a very early period. It is an antique and gloomy town, built of dark volcanic stone. The most remarkable buildings are the cathedral, a huge, irregular, gloomy pile, and the Church of Nôtre-Dame, founded in 580. The manufactures are more numerous than extensive; but the position of the town makes it an important centre of trade. Pop. 103,143.

CLERMONT-TONNERRE (klâr-mōn-ton-nâr). The name of a noble French family of whom one of the most celebrated was Count Stanislas, born in 1757. At the beginning of the Revolution of 1789 he endeavoured to promote the establishment of a constitutional monarchy, founding with Malouet the Monarchical Club, and with Fontanes the *Journal des Impartiaux*. In 1791 he was charged with assisting the king in his attempt to escape, but was set free on swearing fidelity to the Assembly. In 1792, however, he was murdered by the mob at the house of the Comtesse de Brissac.

CLERODENDRON. A large genus of tropical shrubs or trees, nat. ord. Verbenaceæ. *C. Thompsonæ* is often grown in hot-houses for its red and white flowers. Some species have hollow stems inhabited by ants, others have a water-calyx.

CLEVEDON. A coast town of England, Somerset, on the Severn Estuary, 12 miles W. by S. of Bristol, a watering-place and winter resort for invalids, with pier and esplanade, hydropathic and cliffs commanding fine views. Pop. (1931), 7033.

CLEVELAND. A district in the North Riding of Yorkshire, about 28 miles long and 15 miles broad, between the Tees and the coast at Saltburn, also a parliamentary division of the county. It has extensive deposits of iron-ore, which is smelted chiefly at Middlesbrough.

CLEVELAND. A city of the United States, the largest in the State of Ohio, capital of Cuyahoga County, on the south shore of Lake Erie, 255 miles N.E. from Cincinnati. It is divided into two parts by the river Cuyahoga, and is beautifully situated, chiefly on an elevated plain above the lake, and for the most part handsomely laid out with streets crossing each other at right angles. The Cuyahoga is spanned by several bridges, and in particular by the Viaduct, an elevated street and bridge erected at great expense.

Among the buildings are the United States building, city hall, Case hall, medical college, railway depot, etc. Cleveland is an important railway centre, has an excellent harbour and extensive lake traffic, and large manufactures, especially in iron and steel; petroleum-refining and pork-packing being also important industries. There is a harbour of refuge constructed by Government. Pop. (1910), 560,663; (1930), 900,429.

CLEVELAND, Duke of. English title. Its first holder was Barbara Villiers, mistress of Charles II., created duchess in 1670. The daughter of Viscount Grandison and wife of the Earl of Castlemaine, she bore the king three sons who became dukes of Cleveland, Grafton, and Northumberland, and died at Chiswick, 9th Oct., 1709. The Cleveland title became extinct in 1774. In 1833 it was given to William Henry Vane, descended from a daughter of the first duke, but it again became extinct when the 4th duke died in 1891. The duke's seat was Raby Castle, Durham, now the seat of Lord Barnard.

CLEVELAND, Grover. Twenty-second President of the United States, born in New Jersey in 1837, died in 1908. He settled in Buffalo, and, having acquired an excellent position as a lawyer, was elected mayor in 1881. Next year he was elected by the Democrats Governor of New York State, and in 1884, having been nominated for the presidency by the Democratic National Convention at Chicago, was elected on 4th Nov. Civil service reform and tariff reform were advocated by him during his tenure of office, which came to an end in 1889. President Harrison then succeeded, but Cleveland was again elected President in 1892. After retiring from the presidency in 1896, Cleveland made his home at Princeton, where he was appointed a trustee of the university. —BIBLIOGRAPHY: J. L. Whittle, *President Cleveland*; W. O. Stoddard, *Grover Cleveland* (Lives of the Presidents Series).

CLEVES (klēvz; in Ger. *Kleve*). Formerly the capital of the dukedom of Cleves, a town in Rhenish Prussia, 70 miles N.W. of Cologne, about a league from the Rhine, with which it is connected by a canal. It has manufactures of tobacco, leather, and cottons, and a mineral spring with baths. Pop. 20,310.

CLEW BAY. A bay on the west coast of Ireland, County Mayo, containing a vast number of islets, many of them fertile and cultivated.

CLIANTHUS. A genus of Leguminosæ, mostly small shrubs, natives of Australia and New Zealand. *C. puniceus*, parrot's bill or lobster claws, has pretty feathery foliage and very handsome large blood-red flowers. It is hardy in the south of England, and deserves to be more commonly grown.

CLICHÉ (klē-shā). An electrotype or a stereotype cast from an engraving, especially from a woodcut.

CLICHY (klē-shē). A town about 4 miles N.W. of Paris, of which it now forms a suburb. Pop. 50,480.

CLI'ENTS. In ancient Rome, were citizens of the lower ranks who chose a patron from the higher classes, whose duty it was to advise and assist them, particularly in legal cases, and in general to protect them. The clients, on the other hand, were obliged to portion the daughters of the patron if he had not sufficient fortune; to follow him to the wars; and to vote for him if he was candidate for an office. This relation continued till the time of the emperors.

CLIFF DWELLINGS. The name given to ancient dwellings of American aborigines, constructed in the precipitous cliffs that form the walls of gorges and canyons in some of the western states of the Union, especially Arizona, New Mexico, Colorado, and Utah. They were substantially built, on shelves and in recesses of the cliffs, commonly of more than one story in height, and were reached by ladders or other means from below, while inaccessible from above, owing to the steepness or projection of the portion of the cliff above them.

CLIFFORD. The name of a very old English family, several members of which have played an important part in history. The founder of the family, Walter, son of Richard Fitz-Ponce, a Norman baron, acquired the castle of Clifford, in Herefordshire, under Henry II., and hence took the name of Clifford. In 1523 the Cliffords became Earls of Cumberland, but in 1643 this title became extinct. The male line of the Cliffords is at present represented by the baronial family Clifford of Chudleigh. The first Baron Clifford of Chudleigh was Thomas Clifford, one of the members of the Cabal (q.v.), who was raised to this dignity in 1672.

CLIFFORD, JOHN, M.A., D.D. English Baptist minister, Nonconformist leader, and author, born in Derbyshire in 1836. Educated at Nottingham College, and University College, London, he became a prominent leader of the Nonconformists, and took an active part in the passive resistance movement against the Education Act in 1902. From 1858 to 1915 he was minister at the Baptist Chapel, Praed Street, Paddington, and at Westbourne Park. He was also president of the Baptist Union (1888 and 1899), of the Baptist World Alliance (1905-11), and of the World Federation of Brotherhoods (1919-20). Among his publications are: *Is Life Worth Living?* (1880), *The Secret of Jesus* (1904), *The Ultimate Problems of Christianity* (1906), *The Gospel of Gladness* (1912), *State Education after the War* (1916), *Saving the Soul of the World* (1918), *The League of Free Nations* (1919), *The Emergence of the National Mind* (1920). He died in 1923.

CLIFFORD, William Kingdon. English mathematician, born in 1845; educated at King's College, London, and at Trinity College, Cambridge, where he graduated as second wrangler. In 1871 he was appointed professor of applied mathematics at University College, London. In 1876 his health gave way, but was restored by a summer spent in Spain and Algiers, though not permanently, for two years later he again broke down, and died soon afterwards at Madeira, 3rd March, 1879.

As a philosopher, Clifford was a follower of the English school, and opposed to the teaching of modern Hegelians. The most important of his philosophical works are his essays on *Philosophy of the Pure Sciences* and *Body and Mind*. In mathematics his teaching and writings are regarded as marking an epoch in the history of the science in Britain. He did more, perhaps, than any man to popularize in this country the new and fertile ideas of non-Euclidean Geometry and the Theory of Functions.

His *Canonical Dissection of a Riemann's Surface*, his *Theory of Biquaternions*, and his memoir *On the Classification of Loci* are among his most important papers. His work *The Common Sense of the Exact Sciences* was completed by Karl Pearson and published in 1885; see also his *Mathematical Papers*, edited by R. Tucker, and *Lectures and Essays*, edited by L. Stephen and F. Pollock.

CLIFTON. A handsome residentia suburb of Bristol, England. A sus

pension bridge there crosses the River Avon 245 feet above its bed, uniting the counties of Gloucester and Somerset. There is here a tepid mineral spring which formerly attracted visitors.

At Clifton is **Clifton College** a public school for boys, founded in 1862. It has accommodation for about 800 boys, and ranks as one of the great public schools.

CLIMAC'TERIC (*annus climactericus*). According to an old theory, a critical period in human life in which some great alteration is supposed to take place in the constitution. The first climacteric is, according to some, the seventh year; the others are multiples of the first, as 14, 21, etc.; 63 is called the grand climacteric. In modern medicine, however, the term is most commonly applied to "the change of life" in women, which represents the end of the period of reproductive activity.

CLI'MATE. The character of the weather or atmospheric phenomena peculiar to any country as respects heat or cold, humidity or dryness, the direction and force of the prevailing winds, the alternation of the seasons, etc., especially as such conditions affect animal and vegetable life.

In general, geographical latitude is the principal circumstance to be taken into view in considering the climate of a country, and thus the torrid, temperate, and frigid zones may each be said roughly to have a climate of its own. The highest degree of heat is found in the equatorial regions, and the lowest in the polar regions. In the former the temperature continues practically the same all the year round, though there may be alternating rainy seasons and dry seasons. The variations in temperature are very considerable in the temperate zones, and increase as we approach the polar circles. The heat of the higher latitudes, especially about 59° or 60°, is, in July, greater than that of countries 10° nearer the equator, and at Tornea, in Lapland, where the sun's rays are very oblique even in summer, the heat is sometimes equal to that of the torrid zone, because the sun is almost always above the horizon.

But even in the equatorial regions, and still more in intermediate regions, the temperature is affected by local configuration and circumstances. In the deserts of Africa, for instance, owing to the exceptional radiating power of sandy plains and the absence of aqueous vapour in the atmosphere, the heat is excessive, while in the corresponding latitudes of South America the mountainous character of the country makes the climate more moderate. Altitude above the sea, indeed, has everywhere the same effect as removal to a greater distance from the equator, and thus in the Andes we may have a tropical climate at the sea-level and an arctic one on the mountain summits.

The winds to which a country is most exposed by its situation have also a great influence on the climate. In the northern hemisphere if north and east winds blow frequently in any region it will be colder, other conditions being similar, than another which is often swept by milder breezes from the south and west. The climate of Southern Europe, for instance, is decidedly affected by the warm south winds which blow from the hot deserts of Africa.

The greater or lesser extent of coast-line a country possesses in proportion to its area has a decided influence on the climate. The almost unvarying temperature of the ocean equalizes in some degree the periodic distribution of heat among the different seasons of the year, and the proximity of a great mass of water moderates, by its action on the atmosphere, the heat of summer and the cold of winter. Hence the more equable temperature of islands and coasts as compared with that of places far inland, and hence the terms *insular climate* and *continental climate*. The British Isles, Tasmania, and New Zealand enjoy a mild or insular climate as compared with, say, Central Russia or Central Asia. Thus it happens that London has a milder winter and a cooler summer than Paris, though the latter is nearly 3° farther south. Similarly, though Warsaw and Amsterdam are almost in the same latitude, the mean annual temperature of the former is 46·5°, while it reaches at the latter 53·4° F.

The greatest ranges of temperature have been observed in North-Eastern Siberia. At Yakutsk the difference between the hottest and coldest months is 112° F. In British Guiana the difference is only 2°. The proximity of large masses of water involves also the presence of much aqueous vapour in the atmosphere, which may be condensed in abundant rains so as to influence greatly the plant-life of a country. Direction of mountain chains, set of ocean currents, and nature of soil are other modifying elements.

In exhibiting graphically the chief climatic facts of a region various methods may be adopted, but in all the use of *isothermal lines* is one of

the most instructive features. These are lines drawn on a map or chart connecting those places which have the same mean annual temperature or same mean summer or mean winter temperature. In this way we may divide the earth into zones of temperature which by no means coincide with the limits of the zones into which the earth is geographically divided, and when compared with these on a map show interesting and instructive divergences. Geology teaches that vast changes have taken place in the climate of most if not of all countries, the causes of which are not fully understood.

Climate exerts a considerable influence upon man's morals and religion. And although the claim of many students that climate is the *principal* cause of moral and religious peculiarities is rather doubtful, it cannot be denied that climate has its effect on character. The metabolism of life is affected directly, though in different ways, by varying meteorological conditions.—BIBLIOGRAPHY: S. E. Solly, *Handbook of Medical Climatology*; R. de C. Ward, *Climate Considered especially in Relation to Man*; H. N. Dickson, *Climate and Weather*.

CLI'MAX (Gr. *klimax*, a ladder or stairs). A rhetorical figure in which a series of propositions or objects is presented in such a way that the least impressive comes first, and there is a regular gradation from this to the most impressive or final.

CLIMBERS. A name applied to birds of the group Scansores from their climbing habits. They have two toes before and two behind, and are represented by parrots, cockatoos, etc. The term is also applied to such plants as ivy, Virginian creeper, passion flower, scarlet runners, and grape vine.

CLIMBING PERCH (*Anabas scandens*). A singular fish, type of the family Anabantidæ, remarkable for having the pharyngeal bones enlarged and modified into a series of cells and duplications, so that they can retain sufficient water to keep the gills moist and enable the fish to live out of water six days. The climbing perch of India proceeds long distances overland in search of water when the pools in which it has been living have dried up. It is also credited with the power to climb the rough stems of palm trees, but as to this latter point authorities disagree.

CLIMBING PLANTS. Weak-stemmed plants which seek support for their surroundings, in order to rise from the ground. They are of four principal types: (1) *stragglers* or *scramblers*, which, as it were, lean upon other vegetation, weaving their way between branches, and bearing recurved hooks or prickles that prevent them from slipping back, as the bramble and some tropical palms (Desmoncus); (2) *tendril climbers*, which grasp twigs, etc., by means of tendrils, i.e. special organs sensitive to contact (often modified leaves or parts of leaves), e.g. vetches, Clematis Tropæolum, vine; (3) *twiners*, which wind their stems around tree-trunks, etc., e.g. honeysuckle or scarlet runner; twining depends on a special form of *geotropism* (q.v.); (4) *root-climbers*, like ivy, which have special roots developing from the stem and adhering to the support.

Climbers are largest and most abundant in tropical forests, where the struggle for light is most intense; there they often grow into huge woody plants (lianes). Their structure and behaviour is of the greatest interest. — BIBLIOGRAPHY: Charles Darwin, *The Movements and Habits of Climbing Plants*; A. Kerner and F. W. Oliver, *Natural History of Plants*.

CLIN'ICAL MEDICINE (from the Gr. *klinē*, a bed). That department of medicine which teaches how to investigate, at the bedside of the sick, the nature of diseases, to note their course and termination, and to study the effects of the various modes of treatment to which they are subjected. A *clinical lecture* is the instruction which the teacher gives his pupil at the bedside of the patient.

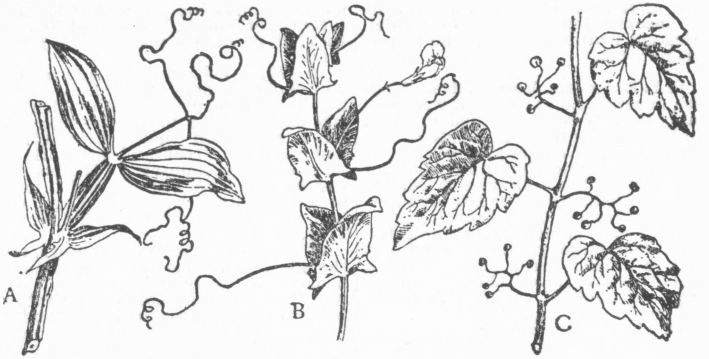
CLINKER-BUILT. A term in shipbuilding when the planks are so arranged that the lower edge of the plank above overlies the edge of that below it.

CLINKSTONE. A quarryman's term (Ger. *klingstein*) for a volcanic rock of the trachytic group, rich in alkalies, which often has a fissile structure due to viscid flow, and which, like slate, rings when struck with the hammer.

CLINOCLASE, or **CLINOCLASITE.** A mineral hydrous copper arsenate, one of the many dark-green copper-ores of the Cornish mines.

CLINO'METER. An instrument used for taking dips, slopes of cuttings, elevations, and angular displacements. In its simplest form a simple pendulum with graduated arc.

CLINTON. A town of Iowa, United States, on the Ohio, 42 miles above Davenport, with railway workshops and foundries. Pop. 25,726.



Climbing Plants

A. Pea, and B, Yellow Vetchling, are tendril climbers; C, creeper adhering by sticky discs at the end of modified branch stems.

CLINTON, Sir Henry. A British general, born about 1738, died in 1795. He served in the Hanoverian War, and was sent to America in 1775, where he distinguished himself in the battle of Bunker Hill. He defeated the Americans at Long Island, but had to abandon Philadelphia to Washington. In 1782 Clinton returned to England.

CLINTONITE, or **SEYBERTITE.** A mineral allied to chloritoid, and, like it, harder than chlorite, occurring in hexagonal plates which split easily, like those of mica. Composition, a hydrous aluminium magnesium calcium iron silicate. It occups in metamorphosed limestone, etc.

CLI'O. In Greek mythology, daughter of Zeus and Mnemosyne; the muse of history. Her attributes are a wreath of laurel upon her head, a trumpet in her right hand, and a roll of papyrus in her left.

CLI'O. A genus of pteropodous molluscs of which one species, *C. boreālis*, is extremely abundant in the northern seas, forming part of the floating population (plankton), and constituting part of the food of the whale, and hence often called *whale's food*.

CLIPPER. A modern build of sailing ship, having a long sharp bow, the greatest beam abaft the centre, and a great rate of speed.

CLITH'EROE. A municipal borough of England, county Lancaster, 28 miles N.N.W. of Manchester, giving its name to a parliamentary division of the county. It is the seat of some large cotton-spinning and weaving establishments, paper manufactories, foundries, and large printworks. Pop. (1931), 12,008.

CLI'TUS. The foster-brother of Alexander the Great. He saved Alexander's life at the Granicus, but

The Convolvulus, another climbing plant.

was afterwards slain by him in a fit of intoxication, an act for which Alexander always showed the bitterest remorse.

CLIVE, Robert, Baron Clive. English general and statesman, was born in 1725 in Shropshire, died in 1774. In his nineteenth year he entered the East India Company's service at Madras as a writer, but in 1747 quitted the civil for the military service. It was a perilous time for British interests in India. The French under Dupleix had gained important privileges and large grants of territory, and in alliance with Chunda Sahib, Nabob of Arcot, were threatening the very existence of the British establishments.

In 1751 Clive, who had already a reputation for skill and courage, marched on the large city of Arcot with 200 British troops and 300 sepoys, and took it, although strongly garrisoned, without a blow, withstood a siege by Chunda Sahib for nearly two months, and at last routed the enemy, took possession of important posts, and returned to Madras completely victorious. In 1753 he sailed to England to recover his health, and was received with much honour.

Two years later he was back in India, in his governorship of St. David's, from which he was soon summoned to command the expedition sent to Bengal, where the Nabob Suraj-ud-Dowlah had attacked the British, destroyed their factories, taken Calcutta, and suffocated over 120 of his prisoners in the Black Hole. Clive soon took possession of Calcutta and brought Suraj-ud-Dowlah to terms, but having no trust in the loyal intentions of the nabob he resolved to dethrone him. With the help of Meer Jaffier, one of the nabob's officers, he effected his purpose, and in the battle of Plassey completely overthrew Suraj-ud-Dowlah's forces. Meer Jaffier now became the new nabob, and Clive was made Governor of Calcutta. Here he was equally successful against the encroachments of the Dutch, defeating their forces both by sea and land.

Clive now visited England again, where his success was highly applauded without much inquiry as to the means by which it was gained; and in 1761 he was raised to the Irish peerage with the title of Lord Clive of Plassey. In 1764 fresh troubles in India brought him back, but now as President of Bengal, with command of the troops there. Before his arrival, however, Major Adams had already defeated the Nabob of Oude, and Lord Clive had only the arranging of the treaty by which the Company obtained the disposal of all the revenues of Bengal, Bahar, and Orissa. In 1767 he finally returned to England.

In 1773 a motion was made in the House of Commons that "Lord Clive had abused the powers with which he was entrusted"; but it was rejected for a resolution that "Lord Clive had rendered great and meritorious services to his country." His health was by this time broken, and in one of his habitual fits of melancholy he put an end to his life, 22nd Nov., 1774.

Clive was of a reserved temper, although among his intimate friends he could be lively and pleasant. He was always self-directed and secret in his decisions, but inspired those under his command with the utmost confidence, owing to his bravery and presence of mind. In private life he was kind and exceedingly liberal. He married the sister of the Astronomer Royal, Dr. Maskelyne; his eldest son was created Earl of Powis. BIBLIOGRAPHY: G. B. Malleson, *Lord Clive* (Rulers of India Series); Sir A. J. Arbuthnot, *Lord Clive* (Builders of Greater Britain Series); Sir John Malcolm, *Life of Clive*; Macaulay's *Essay on Clive*; H. Dodwell, *Dupleix and Clive*.

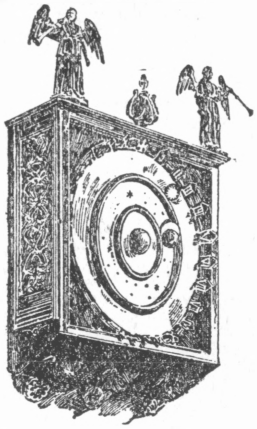
CLIVIA. A genus of South African Amaryllidaceæ. *C. nobilis* and other species are often grown in greenhouses for their showy yellow or orange flowers.

CLOA'CA. An underground conduit for drainage, of which the oldest known example is the *Cloaca Maxima*, or great sewer at Rome, built some 2500 years ago. A portion of it is still standing. It is about 13 feet high and as many wide.—The term is also appied to the excrementory cavity in birds, reptiles, many fishes and lower mammalia (Monotremata), formed by the extremity of the intestinal canal, and conveying outwards the fæces and urine.

CLOCK. A machine for measuring time and indicating hours, minutes, and usually seconds, by means of hands moving on a dial-plate, and differing from a watch mainly in having the movement of its machinery regulated by a pendulum, and in not being portable. The largest and most typical clocks also differ in having their machinery set in motion by means of a falling weight or weights, the watch wheel-work being moved by the force of an uncoiling spring; but many clocks also have a spring setting their works in motion.

Early Timepieces.—The use of a *horologium*, or hour-teller, was com-

mon even amongst the ancients, but their time-pieces were sun-dials, hour-glasses, and clepsydræ. In the earlier half of our era we have accounts



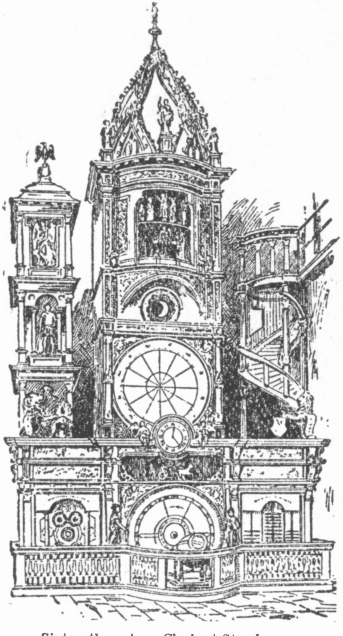
Fourteenth-century Clock at Wimborne

of several attempts at clock construction: that of Boethius in the sixth century, the clock sent by Harun al Rashid to Charlemagne in 809, that made by Pacificus, Archdeacon of Verona, in the ninth century, and that of Pope Sylvester II. in the tenth century. It is doubtful, however, if any of these was a wheel-and-weight clock, and it is probably to the monks that we owe the invention of clocks set in motion by wheels and weights.

In the twelfth century clocks were made use of in the monasteries, which announced the end of every hour by the sound of a bell put in motion by means of wheels. From this time forward the expression "the clock has struck" is often met with. The hand for marking the time is also made mention of. In the fourteenth century there are more traces of the present system of clock-work. Dante, for example, mentions clocks. Richard, Abbot of St, Albans, in England, made a clock, in 1326, such as had never been heard of till then. It not only indicated the course of the sun and moon, but also the ebb and flood tide.

Large clocks on steeples likewise were first made use of in the fourteenth century. Watches are a much later invention, although they have likewise been said to have been invented as early as the fourteenth century. A celebrated clock, the construction of which is well known, was set up in Paris for Charles V. in 1379, the maker being Henry de Vick, a German. It probably formed a model on which clocks were constructed for nearly 300 years, and until Huyghens applied the pendulum to clock-work as the regulating power, about 1657.

The Pendulum.—The great advantage of the pendulum is that the beats or oscillations of a pendulum all occupy substantially the same time (the time depending on its length), hence its utility in imparting regularity to a time-measurer. The mechanism by which comparative regularity was previously attained, though ingenious and simple, was far less perfect; and the first pendulum *escapement*, that is, the contrivance by which the pendulum was connected with the clock-work, was also less perfect than others subsequently introduced, especially

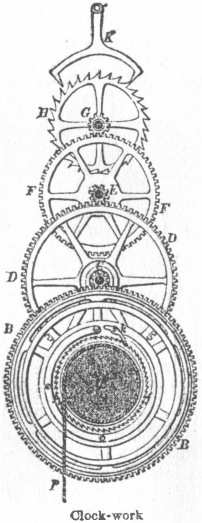


Sixteenth-century Clock at Strasbourg

Graham's *dead-beat* escapement, invented in 1700. (*See* ESCAPEMENT.) In a watch the balance-wheel and spring serve the same purpose as the

pendulum, and the honour of being the inventor of the balance-spring was contested between Huyghens and the English philosopher Dr. Hooke.

Improved Construction.—Various improvements followed, such as the chronometer escapement, and the addition of a compensation adjustment, by which two metals having unequal rates of expansion and contraction under variations of temperature are combined in the pendulum or the balance-wheel, so that, each metal counteracting the other, the vibrations are isochronous under any change of temperature. This arrangement was perfected by Harrison in 1726, and is especially useful in navigation.



Clock-work

The accompanying illustration shows the going part of a clock in its simplest form. *A* is a drum on which is wound the cord *P*, to which the weight is attached, the drum having a projecting axis with a square end to receive the key in winding up the clock. The drum is connected with *B*, the first wheel of the train, by means of the ratchet wheel *f*, and catch *k*, which allow the clock to be wound up without turning *B*. The wheel *B* drives the pinion *C* and the wheel *D*, the latter called the centre-wheel; and there is a similar connection between *D*, *E*, *F*, *G*, and *H*. The last is named the escape-wheel, and into its teeth work the pallets of the anchor *K*, which swings backward and forward with the pendulum. The wheel *D* turns once in an hour, the wheel *H* 60 times (the pendulum marking seconds), and by means of other wheels, and one axis working inside another, the clock hands and dial show hours, minutes, and seconds.

The chiming machinery of a clock, or that by which hours and quarters are sounded, is no necessary part of a clock, and forms, indeed, a separate portion of the works, usually driven by a separate falling weight, and coming into play at certain times when there is a temporary connection between the two portions of the clock machinery. (*See also* WATCH.)

Electric Clocks.—During the last eighty years many forms of electric clocks have been designed. Much progress has been made in recent years. There are several distinct types in use to-day. 1. Self-contained clocks in which electricity provides the motive-power, usually by electro-magnetic impulses to the pendulum or balance. 2. Clocks with an independent power, but having the vibrations of their pendulums controlled by electric currents from a standard clock. 3. Clocks having an independent motive-power, wound by electricity. 4. Simple dial-works actuated at regular intervals, usually once per half-minute, or once per minute, by an electric current from a "master."

The last named has proved the most successful. It is economical, as the dial-works are very simple, and one master clock can actuate many hundreds of the "journeymen," so long as a sufficient battery-power is supplied, in proportion to the number of subsidiary dials in the circuit. It has also this great advantage, that all the dials throughout a large establishment, in different buildings, will be indicating the same time as the master.—BIBLIOGRAPHY: Mathieu Planchon, *L'Horloge, son histoire retrospective, pittoresque et artistique*; F. J. Britten, *Old Clocks and Watches and their Makers*; H. H. S. Cunynghame, *Time and Clocks: Ancient and Modern Methods of Measuring Time.*

CLO'DIUS PULCHER, Publius. A notorious public character of ancient Rome, son of Appius Claudius Pulcher, who was consul about 79 B.C. He served in the third Mithridatic War under Lucullus, and filled different high posts in the provinces of the East, where his arrogance was the cause of serious disturbances. Returning to Rome, he became a popular demagogue,

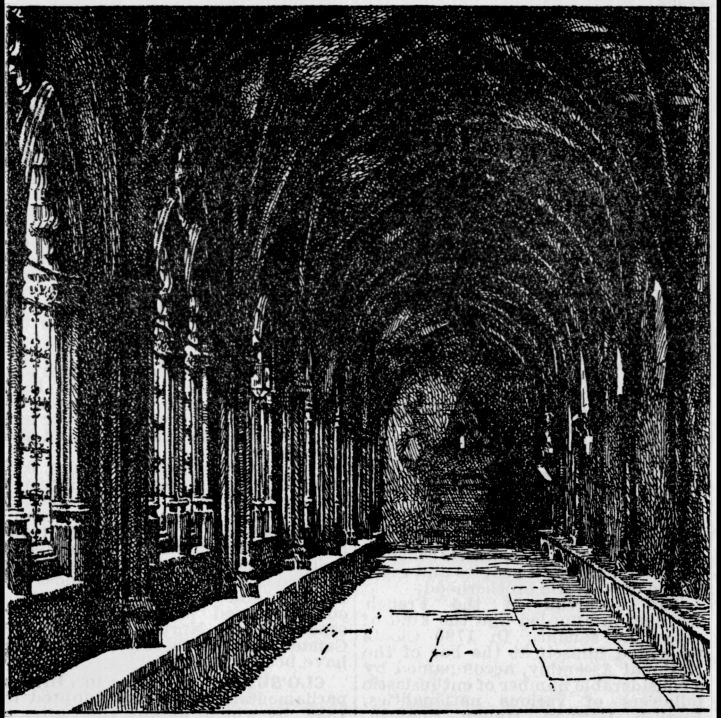
was elected tribune in 59 B.C., was the means of procuring Cicero's banishment, and continued to be a ringleader in all the seditions of the time till killed in an encounter between his followers and those of Titus Annius Milo. One of Cicero's orations, *Peo Milone*, was written in defence of Milo.

CLOG-ALMANAC. An almanac or calendar made by cutting notches or characters on a *clog* or block, generally of wood. The block had generally four sides, three months for each edge. The number of days is marked by notches, while various symbols are used to denote saints' days, the golden number, etc. The clog-almanac is said to have been of Danish origin.

CLOGHER (klŏ'gĕr). A village and old episcopal see of Ireland, in County of Tyrone, with cathedral and bishop's palace. It is a see both of the Church of Ireland and of the Roman Catholic Church. St. Patrick is said to have been first Bishop of Clogher. Pop. 197.

CLOISONNE (klwá-son-ā). *See* ENAMEL.

CLOIS'TER (equivalent to the Latin word *clausura*, from *claudere*, to shut up), an arched way or gallery, often forming part of certain portions of monastic and collegiate buildings, usually having a wall of the building on one side, and an open colonnade, or a series of windows with piers and columns adjoining an interior yard or court on the other side. Such galleries were originally intended as places of exercise and recreation, the persons using them being under cover. Among the many beautiful cloisters still in existence are those



Cloisters, Westminster Abbey

of St. John Lateran, at Rome; of the convent of St. Scholastica, at Subiaco; of Arles, in France; of the royal convent of Huelgas, near Burgos, in Spain; and of Monreale and Cefalu, in Sicily. The term is also used as equivalent to convent or monastery.

CLONAKIL'TY. A seaport, Irish Free State, County Cork, with a considerable trade in grain. Pop. (1926), 2771.

CLONES. A town, Irish Free State, County Monaghan, with remains of an abbey and a round tower. Pop. (1926) 2358.

CLONMEL'. A municipal and, until 1885, parliamentary borough, Irish Free State, partly in County Waterford and partly in County Tipperary. It lies in a beautiful valley on both sides of, and on two islands in, the River Suir, and has a jail, barracks, and court-house; carries on tanning, brewing, and flour-milling, and has a trade in agricultural produce. Pop. (1926), 8989.

CLONTARF'. A town, Irish Free State, County Dublin, on the northern shore of Dublin Bay. It is a much-frequented watering-place, and is historically interesting as the scene of Brian Boroimhe's victory over the Danes in 1014. Pop. 4613.

CLOOTS (klōts), **Jean Baptiste, Baron.** A singular character well known during the revolutionary scenes in France under the appellation of *Anacharsis Cloots*. He was born near Cleves, at the castle of Gnadenthal, in 1755, and was brought up at Paris. He became possessed of a considerable fortune, which he partly dissipated in fantastic schemes for the union of all peoples and races in one democratic brotherhood.

The outbreak of the French Revolution afforded him the kind of career he sought. In 1790 Cloots presented himself at the bar of the National Assembly, accompanied by a considerable number of enthusiastic followers of various nationalities, English, German, Italian, Spanish, Arabians—or Parisians dressed up as such. He described himself as the orator of the human race, and demanded the right of confederation, which was granted him.

His enthusiasm for radical reforms, his hatred of Christianity and of royalty, and a gift of 12,000 livres on behalf of the national defence gained him, in Sept., 1792, election to the National Convention, in which he voted for the death of Louis XVI. in the name of the human race. But, becoming an object of suspicion to Robespierre, he was arrested and guillotined, 24th March, 1794. He met his fate with great indifference. Among his works are *La certitude des preuves du mahométisme* (1780), and *La république universelle* (1791).

CLOSE BOROUGH. A borough, the right of nominating a member of Parliament for which was in the hands of a single person.

CLOSE CORPORATION. A corporation which fills up its own vacancies, the election of members not being open to the public.

CLOSE-HAULED. In navigation, said of a ship when the general arrangement or trim of the sails is such as to enable her to sail as nearly against the wind as possible.

CLOSE-SEASON. A period of the year, usually, though not always, coinciding with the breeding season, during which legal enactments or sporting custom prohibit the shooting or hunting of certain wild animals and birds. As an example of exceptions to the above-named general rule may be mentioned otter-hunting, which, as it is impossible for hounds to work in very cold water, is carried on from the middle of April to the middle of September. The fox, although protected by no written law, is not hunted between 1st April and 1st Nov.; while, though no legal close-season is enforced for deer, no stags are killed between October and August, or hinds between March and November.

Partridges, pheasants, grouse, and many other game-birds are protected by law; the Wild Birds Protection Acts secure immunity for many smaller kinds; and salmon and trout are similarly cared for. Details of British close-seasons for all creatures affected may be found in most almanacs and annuals. In foreign countries and in British colonies, especially in North America and Canada, similar protective regulations have been adopted.

CLO'SURE. A rule in British parliamentary procedure adopted in 1882, by which, at any time after a question has been proposed, a motion may be made with the Speaker's or Chairman's consent "That the question be now put," when the motion is immediately put and decided without debate or amendment. So also if a clause of a Bill is under debate a motion that it stand or be added may be put and carried in the same way. The motion must be supported by more than 100 members and opposed by less than 40, or have the support of 200 members. The introduction of the closure was intended to prevent

debates from being too much spun out. (*See* PARLIAMENT.) In France *clôture* has been frequently used since 1851.

CLOTH. A fabric formed by interweaving threads or fibres of animal or vegetable origin, as wool, hair, cotton, flax, or hemp. Cloth may also be made by *felting* as well as by weaving. *See* COTTON; WOOL; SILK.

CLOTHES-MOTH. The name common to several moths of the genus Tinĕa, whose larvæ are destructive to woollen fabrics, feathers, or furs upon which they feed, using at the same time the material for the construction of the cases in which they assume the chrysalis state.

CLOTHING. Nothing is more necessary to comfort than that the body should be kept in nearly a uniform temperature, thus preventing the disturbance of the important excretory functions of the skin by the influence of heat or cold. Hence in a changeable climate the question of clothing becomes of special importance. The chief aim in clothing the body ought to be protection from atmospheric changes. A degree of cold amounting to shivering cannot be felt without injury in some form to the general health of the body, and the strongest constitution cannot resist the benumbing influence of a sensation of cold constantly present, even if it be so moderate as not to occasion immediate complaint, or to induce the sufferer to seek protection from it. This degree of cold often lays the foundation of the whole host of chronic diseases, foremost amongst which is consumption.

Wool is the most satisfactory material for use in clothing, and one which provides the protection required against the changes of temperature. Those who desire to benefit from the wearing of woollen material must wear the woollen garment next the skin, for it is in this position, mainly, that its health-preserving power may best be felt. The main advantages of wool as material for making garments are: (1) the readiness with which it allows the escape of perspiration through its texture; (2) its power of preserving the sensation of warmth to the skin under all circumstances; (3) the slowness with which it conducts heat from the body; (4) the softness, lightness, and pliancy of its texture.

Next in point of excellence with regard to health-preserving qualities ranks stockinette or woven webbing. This provides an ideal material for underclothing. It is made entirely of wool, and possesses all the good qualities already mentioned. Aertex cellular cloth possesses excellent qualities also, being porous and a good non-conductor of heat. It retains a large proportion of air in its meshes, and consequently is cool in summer and warm in winter. It is light, durable, and unshrinkable.

Spun silk and silk-and-wool underwear have all the advantages of the foregoing materials, with the great disadvantage of being very costly. Cotton cloth provides an admirable substitute for wool and woven materials, and is the next best substance of which clothing may be made. It is light to wear, may be had in various qualities, is easily obtained and not too expensive, and the wear is everything that could be desired. Linen possesses none of the good qualities of wool. It retains the matter of perspiration and speedily becomes imbued with it, thus giving an unpleasant sensation of cold to the body. It is readily saturated with moisture, and conducts heat too rapidly. For these reasons it is now rarely used. Clothes should be made so as to allow the body the full exercise of all its motions. The neglect of this precaution does much harm.—BIBLIOGRAPHY: K. W. Watson, *Textiles and Clothing* (Library of Home Economics, vol. x.); J. Bray, *All About Dress*; G. Migeon, *Les Arts du Tissu*.

CLO'THO. In Greek mythology, that one of the three Fates or Parcæ whose duty it was to put the wool for the thread of life round the spindle, while that of Lachĕsis was to spin it, and that of Atrŏpos to cut it when the time had come.

CLOUD. A mass of visible vapour, or watery or icy particles, suspended in the atmosphere. Clouds are formed in various ways. In warm weather the ground is warmed, particularly in certain places, and ascending currents are set up. When the air rises, its pressure is reduced, and it is in consequence cooled by the expansion. Finally it comes to a level at which its temperature is no longer sufficient to contain its moisture in the invisible form. Condensation commences, and cloud is produced. Thus the summer cumuli are formed, their flat bases indicating the level at which the condensation begins.

When a warm and a cold current of air meet, the latter tends to pass under the former and force it up. Hence, also, cloud is formed, and possibly rain. A similar result follows from wind coming upon the inclined surface of a mountain.

Warm air encountering a cold land- or sea-surface may also produce condensation of cloud or fog. A fall of atmospheric pressure, by the expansion and consequent cooling, is another cause.

If two masses of saturated air at different temperatures mix, the combination will be super-saturated and deposition follow, but only to a very limited extent. Air may also be cooled, and its moisture deposited, as a result of its own radiation into surrounding space exceeding that which it is receiving from the earth, or it may be cooled through imparting its heat by conduction to a neighbouring stratum of air.

The first attempt at a systematic classification of the clouds was made by Luke Howard in 1803. He distinguished three main classes:—1. The *cirrus* (Lat., "wisp of hair"), so called from its resemblance to a lock of hair. It has a light, wispy, or fibrous nature. 2. The *cumulus* (Lat., "heap"), which assumes the form of dense convex or conical heaps resting on a flattish base, called also "summer-cloud." Under ordinary circumstances cumulus clouds accompany fine weather, especially in the heat of summer. As a rule they attain their greatest size early in the afternoon, and generally decrease towards sunset. 3. The *stratus*, so named from its spreading out uniformly in a horizontal layer. It belongs mainly to the night. When resting upon the ground, it forms what we call a fog. Various classifications of a more detailed description than Howard's have subsequently been suggested, and a standard international classification has been drawn up for general use by meteorologists. In this the classes recognized are: 1. *Cirrus*. 2. *Cirro-stratus*. Both the foregoing are composed of minute ice particles, and float at a height of 5 or 6 miles. Cirro-stratus is a thin, whitish sheet of cloud, sometimes covering the whole sky, and giving it a milky appearance. In this cloud are occasionally seen halos, mock-suns, and sun pillars. 3. *Cirro-cumulus*, or mackerel sky, small globular masses or flakes, ranged in groups or lines. 4. *Alto-cumulus*, large globular masses, closely packed. 5. *Alto-stratus*, a thick sheet of a grey or bluish colour. These three classes are at heights of 2 to over 4 miles. 6. *Strato-cumulus*, large globular masses or rolls of dark clouds. 7. *Nimbus*, or rain cloud, a thick layer of dark cloud with ragged edges. Strato-cumulus and nimbus are generally under 1½ miles high. 8. *Cumulus*, averaging about 1 mile above the earth. 9. *Cumulo-nimbus*, heavy masses rising in the form of turrets or anvils, generally surmounted by a sheet of low-altitude cirrus ("false cirrus"). This cloud may extend from under 1 mile at its base upwards to 2 or 5 miles, and is the thunder-cloud and shower-cloud. 10. *Stratus*, usually under an altitude of 1 mile. Another class sometimes recognized is *mammato-cumulus*, also called *festoon-cloud*, a cumulus with protuberances indicating rain. It is sometimes dangerous to aviators.

Apart from their effects in fertilizing the ground by distribution of moisture in the form of rain, clouds have important influences upon the temperature of the earth's surface. While they act as a cooling agency in intercepting the sun's rays on their passage to the earth, they also often act as a protective against great cold by diminishing the radiation of heat from the earth into space. Their influence upon climate is, therefore, in general, of a preponderantly moderating description. — BIBLIOGRAPHY: W. Clement Ley, *Cloud-land*; A. W. Clayden, *Cloud Studies*; George A. Clarke, *Clouds*.

CLOUD (klö), **St.** A town, France, department of Seine-et-Oise, 6 miles S.W. of Paris, charmingly situated on the slope of a hill overlooking the River Seine. It is celebrated for the scenery of its magnificent park, a favourite holiday resort of the Parisians. As the residence of the monarchs of France, St. Cloud is historically interesting. Louis XIV. bought the old château and presented it to his brother, the Duc d'Orléans, who enlarged and transformed it into a splendid palace, which became the residence of Henrietta, queen of Charles I. of England, during her exile. It was sold by Louis-Philippe of Orleans to Marie Antoinette, and after the Revolution chosen by Napoleon for his residence. It was the summer residence of Napoleon III., and was greatly damaged in the Franco-Prussian War. Pop. 7300.

CLOUDBERRY, or **MOUNTAIN BRAMBLE** (*Rubus chamæmōrus*). A fruit found plentifully in the north of Europe, Asia, and America, and common in some of the more elevated moors of Britain, of the same genus as the bramble or blackberry. The plant is from 4 to 8 or 10 inches high, with a rather large handsome leaf, indented and serrated at the edges. The flowers are large and white, and the berries, which have a very fine flavour, are orange-yellow in colour, and about the size of a bramble-berry. The cloudberry is the badge of the clan M'Lean.

CLOUGH (kluff), **Arthur Hugh.** English poet, born at Liverpool 1st Jan., 1819. He studied under Dr. Arnold at Rugby, and then at Oxford. On his return from a tour in America (1852) he was appointed an examiner attached to the educational branch of the Privy Council office. He died 13th Nov., 1861, at Florence, while returning from a journey to Greece. His poems, of which the best known are *Bothie of Tober-na-Vuolich* (or *Toper-na-Fuosich*), *Amours de Voyage*, and the long poem *Dipsychus*, were published, along with a memoir, by F. T. Palgrave in 1862.—Cf. S. Waddington, *Arthur Hugh Clough: a Monograph.*

CLOVER, or **TREFOIL.** A name of different species of plants of the genus Trifolium, nat. ord. Leguminosæ. There are about 300 species, of which 18 are natives of Britain. Some are weeds, but many species are valued as food for cattle. *T. pratense*, or common red clover, is a biennial, and sometimes, especially on chalky soils, a triennial plant. This is the kind most commonly cultivated, as it yields a larger product than any of the other sorts.

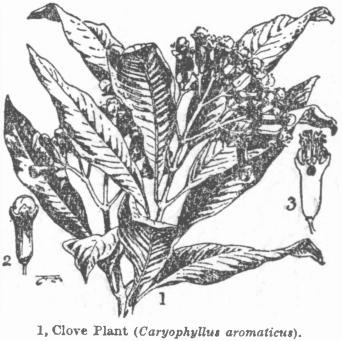
Trifolium repens, or white clover, is a most valuable plant for pasturage over the whole of Europe, Central Asia, and North America, and has also been introduced into South America. The bee gathers much of its honey from the flowers of this species. *T. hybridum*, Alsike, hybrid, or Swedish clover, has been long cultivated in the south of Sweden, and for some time also in other countries; it is strongly recommended for cold, moist, stiff soils. It resembles the common red clover in duration, stature, and mode of growth.

T. medium, perennial red or meadow clover, much resembles the common red, but differs somewhat in habit, and the bright-red flowers are larger and form a less compact head. Its produce is less in quantity, and not so nutritive, as that of the common red. The name clover is often applied to plants like medick and melilot, cultivated for the same purpose and belonging to the same natural order, although not of the same genus.

CLOVER-WEEVIL. A kind of weevil, genus Apion, different species of which, or their larvæ, feed on the leaves and seeds of the clover, as also on tares and other leguminous plants. *A. apricans*, of a bluish-black colour, and little more than a line in length, is especially destructive.

CLOVES (derived from the Fr. *clou*, a nail). A very pungent aromatic spice, the dried flower-buds of *Caryophyllus aromaticus*, a native of the Molucca Islands, belonging to the myrtle tribe, now cultivated in Sumatra, Zanzibar, Malacca, and Jamaica. The Dutch, with a view to securing the monopoly, endeavoured to exterminate the tree from all the Molucca Islands, except Amboyna, but in 1770 the French succeeded in conveying it from Ceram to Cayenne. The tree is a handsome evergreen from 15 to 30 feet high, with large elliptic smooth leaves and numerous purplish flowers on jointed stalks.

Every part of the plant abounds in the volatile oil for which the flower-buds are prized. When the stalk is allowed to mature into a succulent



1, Clove Plant (*Caryophyllus aromaticus*).
2, Flower-bud, on left. 3, Section of flower, on right.

purple-coloured berry, containing one or two seeds, it is called the "mother-clove." The spice yields a very fragrant odour, and has a bitterish, pungent, and warm taste. It is sometimes employed as a hot and stimulating medicine, but is more frequently used in cookery.

CLOVIS (from O.Ger. *Chlodwig*, Mod. Ger. *Ludwig*, Fr. *Louis*). King of the Franks, born A.D. 465, succeeded his father, Childeric, in the year 481, as chief of the warlike tribe of Salian Franks, who inhabited Northern Gaul. In 486 he overthrew the Roman governor at Soissons and occupied the country between the Somme and the Loire. The influence of his wife Clotilda, a Burgundian princess, at length converted him to Christianity, and on 25th Dec., 496, he was baptized with several thousands of his Franks at Rheims, and was saluted by Pope Anastasius as "most Christian king," he being orthodox, while most of the western princes were Arians.

It now became his object to rid himself by all means of all the other Frankish rulers, in order that he might leave the whole territory of the Franks to his children; and in this purpose he succeeded by treachery and cruelty. He died at Paris, which he had made his capital, on 27th Nov., 511. In the last year of his reign Clovis had called a council at Orleans, from which are dated the peculiar privileges claimed by the Kings of France in opposition to the Pope.—Cf. G. Kurth, *Clovis*.

CLOWN. The buffoon or practical jester in pantomime and circus performances. On the old English

Clown

stage the clown was the privileged laughter-provoker, who, without taking any part in the dramatic development of the piece represented, carried on his improvised jokes and tricks with the actors, often, indeed, addressing himself directly to the audience instead of confining himself to what was going on on the stage. In Shakespeare's dramas a distinct part is assigned to the clown, who no longer appears as an extempore jester, although the part he plays is to a certain extent in keeping with his traditional functions. He is now confined to the pantomime and the circus, in the former of which he plays a part allied to that of the French *pierrot*. *See* PANTOMIME.

CLOYNE. A town in Ireland, 15 miles E. by S. of Cork, the seat of a Roman Catholic bishop. From 1638 to 1835 it was the see of a bishop of the Established Church, but in the latter year it was united with Cork and Ross. Pop. 756.

CLUB. A select number of persons in the habit of meeting for the promotion of some common object, as social intercourse, literature, politics, etc. It is a peculiarly English institution, which can scarcely be said to have taken root in any other country except America. In its modern sense the word "club" became common in England at the time of *The Tatler* and *The Spectator*, i.e. at the beginning of the eighteenth century.

The coffee-houses of the seventeenth and eighteenth centuries are the best representatives of what is meant by a modern club, while the clubs of that time were commonly nothing but a kind of restaurants or taverns where people resorted to take their meals. But while anybody was free to enter a coffee-house, it was absolutely necessary that a person should have been formally received as a member of a club, according to its regulations, before he was at liberty to enter it.

Among the earliest of the London clubs was the Kit-cat Club, formed in the reign of Queen Anne, among whose forty members were dukes, earls, and the leading authors of the day. Another club formed about the same time was the Beefsteak Club. Originally these two clubs had no pronounced political views, but in the end they began to occupy themselves with politics, the Kit-cat Club being Whig, and the Beefsteak Club Tory. Perhaps the most celebrated club of the eighteenth century was that which was first called The Club *par excellence*, and numbered among its members Dr. Johnson, Sir Joshua Reynolds, Edmund Burke, Oliver Goldsmith, Edward Gibbon, and others.

The number of regularly established clubs in London is now about 150. The most important of these are: Army and Navy (1837); Athenæum (1824); British Empire (1910); Carlton (1832), a sort of head-quarters for the Conservative party; Constitutional (1883); National Liberal (1822); Reform (1837); Turf (1868); and United Service (1815). Similar clubs exist also in Edinburgh, Glasgow, and other cities of the kingdom. Some London clubs admit women members, while there are several clubs for women only.

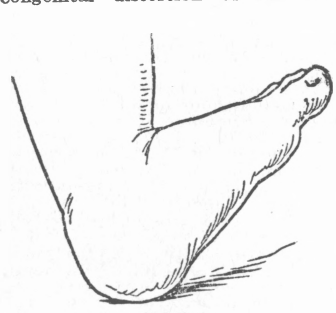
Clubs are often provided with reading-room and library, smoking-room, billiard-room, coffee-room, dining-room, and drawing-room, and also may have a certain number of bedrooms. Besides being convenient for social intercourse, members may obtain their meals in them, served in

the best style and at moderate cost. New members are admitted by ballot, and pay a certain entrance fee as well as an annual subscription.

The number of English clubs existing in 1921 was over 8000. The English clubs have been imitated in different countries in Europe, but not with great success. In France, where they were introduced at an early period, they soon became associations purely political in their nature, and had no uniform and regular form, as they were only tolerated during revolutionary epochs. The Club des Jacobins, the Club des Feuillants, the Club des Cordeliers, and the Club de Montrouge were the most famous clubs of the time of the first French Revolution. After the revolutions of 1848 hosts of clubs started into existence in France, Germany, and Italy; but the institution has always failed to take a deep hold on European continental society. —BIBLIOGRAPHY: Ned Ward, *The Secret History of Clubs of all Descriptions* (1709); John Timbs, *History of Clubs and Club Life*; G. J. Ivey, *Clubs of the World*; R. Nevill, *London Clubs*; T. H. S. Escott, *Club Makers and Club Members*; E. C. A. Leigh, *List of English Clubs in all parts of the World*; J. Wertheimer, *Law relating to Clubs*.

CLUBBING. *See* FINGER AND TOE DISEASE.

CLUB-FOOT (Lat. *Talipes*). A congenital distortion of the foot.



Club Foot

There are several varieties. Sometimes the foot is twisted inwards (*T. varus*); sometimes the heel is raised and the toes only touch the ground (*T. equinus*); sometimes the foot is twisted outwards (*T. valgus*); or it rests only on the heel (*T. calcaneus*). In most cases the deformity is curable by modern surgery.

CLUB-HAULING. A method of tacking a ship in dangerous situations by letting go the lee-anchor as soon as the wind is out of the sails, her head being thus brought to the wind, and then cutting the cable and trimming the sails as soon as she pays off.

CLUB-MOSS, or **Ground Pine.** The common name of the plants of the ord. Lycopodiaceæ, or more particularly of the genus Lycopodium.

CLUE. Of a square sail, is the lower corner.

CLUJ. The modern name of Klausenburg (g.v.), the capital of Transylvania, Romania.

CLUNES. An important mining-town in Victoria, Australia, 120 miles N.W. of Melbourne. Pop. 3213.

CLUNY (klu-nē). A town of Eastern France, department of Saône-et-Loire, 11 miles N.W. of Macon; pop. 4260. Here was a Benedictine abbey, founded in 1910 by William I. the Pious, Count of Auvergne. The abbey was at one time the most celebrated in France, having 2000 monastic communities directly under its sway in France, Italy, Spain, England, etc., the inmates of which formed the congregation of Cluniac monks. Popes Gregory VII., Urban II., and Paschal II. were members of the Congregation of Cluny. Most of the abbey church was destroyed in 1789, and the present town is to some extent built of its debris and occupies its site. There is a national school of arts and trades.

CLUPE'IDÆ. The herring family, the typical genus being Clupĕa, the herring, a family of fishes which includes the herring, sprat, pilchard, and anchovy. Sardines are immature pilchards, while whitebait chiefly consists of herring fry.

CLUSTER. System of stars having some physical association. Star clusters congregate mostly towards the Milky Way. Some are irregular, e.g., the familiar Pleiades. Many have a globular form.

CLUSTERED COLUMN. In architecture, a pier which appears to consist of several columns or shafts clustered together; they are sometimes attached to each other throughout their whole height, and sometimes only at the capital and base.

CLU'THA. The largest river in New Zealand, in the southern part of the South Island. It receives the waters of Lakes Hawea, Wanaka, and Wakatipu, and flows in a south-eastern direction, having a length of 150 miles. It is called also Molyneux.

CLYDE (klīd). A river of Scotland, which has its sources among the hills that separate Lanarkshire from the counties of Peebles and Dumfries, passes by Lanark, Hamilton, Glasgow, Renfrew, Dumbarton, and Greenock, and forms finally an extensive estuary or firth before it enters the Irish Sea, at the southern extremity of the Island of Bute. From its source to Glasgow, where navigation begins, its length is 70 or 80 miles. Its principal tributaries are the Douglas Water, the Mouse, the Nethan, the Avon, the Calder, the North Calder, the Kelvin, the White and Black Cart, and the Leven. Near Lanark it has three celebrated falls—the uppermost, Bonnington Linn, about 30 feet high; the next, Corra Linn, where the water takes three distinct leaps, each about as high; and Stonebyres. Those falls have been utilized to provide power for an important hydro-electric scheme. The Clyde, by artificial deepening, has been made navigable for large vessels up to Glasgow, and there are dock facilities for the biggest liners.

CLYDE, Colin Campbell, Lord. Born in Glasgow in 1792, where his father, Colin M'Liver, a native of Mull, worked as a cabinet-maker. His mother's maiden name was Campbell, and she was the daughter of a small proprietor in Islay. By the assistance of his mother's relations he was educated at the High School of Glasgow, and afterwards at the Military Academy, Gosport. In 1808 he received an ensign's commission in the 9th Regiment of Foot, having previously changed his name to Campbell, at the suggestion of his maternal uncle, an officer in the army.

He served in Spain under Sir John Moore and Wellington, being engaged in the battles of Barossa and Vittoria, and having displayed distinguished gallantry at the siege of San Sebastian, where, as well as at the Bidassoa, he was severely wounded. From 1819 to 1825 he was in the West Indies. In 1835 he attained the rank of lieutenant-colonel. In 1842 he was in China in command of the 98th Regiment, and on the termination of the Chinese War saw active service in India, where he acquired such reputation in the second Sikh War as to receive the thanks of Parliament and the title of K.C.B. In 1854 he became major-general, with the command of the Highland Brigade in the Crimean War.

His services at the battles of Alma and Balaklava, and during the war generally, were conspicuous, so that on the outbreak of the Indian Mutiny he was appointed to the chief command there. Landing at Calcutta on 29th Aug., 1857, he relieved Havelock and Outram at Lucknow, and crushed the rebellion entirely before the end of the year. For his services here Sir Colin received the thanks of both Houses of Parliament, was created a peer with the title of Baron Clyde, and had an income of £2000 a year allotted him. In 1862 he was made field-marshal. He died 14th Aug., 1863, and was buried in Westminster Abbey.—BIBLIOGRAPHY: L. Shadwell, *Life of Colin Campbell, Lord Clyde*; Sir Owen T. Burne, *Clyde and Strathnairn*; Forbes, *Colin Campbell, Lord Clyde*.

CLYDEBANK. A town of Scotland, Dumbartonshire, of recent origin, on the north bank of the Clyde, 6¼ miles below Glasgow, with shipbuilding, etc. Pop. (1931), 46,963.

CLYMENIA. A cephalopod intermediate between the nautiloid and ammonoid types, with a closely coiled shell in which the partitions are simple in their folding, with siphonal tube running through them on the inner or concave side of the shell. It is characteristic of marine Devonian strata and extinct before the Carboniferous, when the ammonoid type became well established.

CLYNES, John Robert. British politician, born at Oldham, 1869. As a boy he worked in a cotton-factory, devoting his spare time to study. In 1891 he was appointed organizer of the Gasworkers' and General Labourers' Union for Lancashire, and in 1906 entered Parliament as a Labour member. Parliamentary Secretary to the Food Ministry in July, 1917, he succeeded Lord Rhondda as Food Controller in 1918, when he was also made a Privy Councillor. He was Secretary of State for Home Affairs from 1929 to 1931. In 1931 he resigned and lost his seat in the House of Commons.

CLYTEMNES'TRA. In Greek mythology, daughter of King Tyndareus and Leda, and wife of Agamemnon. During the absence of her husband in the war against Troy she became the mistress of Ægisthus, and, in connection with him, murdered Agamemnon on his return from Troy, and, together with her paramour, governed Mycenæ for seven years. Her son Orestes killed them both. *See* AGAMEMNON and ORESTES.

CNI'DUS, or GNIDUS. An ancient Greek town in Caria, a province of Asia Minor, a great seat of the worship of Aphroditē (Venus), who had three

Coach. Early Nineteenth Century

temples here, in one of which was a famous statue of the goddess by Praxiteles. It has perished, but the most faithful copy of it is in the Vatican Gallery.

CNOSSUS. Ancient city of Crete. Situated on the River Caeratius, 3 miles from the harbour of Candia, its legendary association with the minotaur and the labyrinth has been elucidated by the researches of Sir Arthur Evans. The architectural details and the treasures of fresco-painting, ceramics, sculpture, and metal work have revealed a civilization of the most wonderful kind. Its modern name is Katsabas.

COACH. A general name for all covered carriages drawn by horses and intended for the rapid conveyance of passengers. The earliest carriages appear to have been all open, if we may judge from the figures of Assyrian and Babylonian chariots found on the monuments discovered amidst the ruins of Nineveh and Babylon. At Rome both covered and uncovered carriages were in use. After the fall of the Roman Empire they went out of use again, and during the feudal ages the custom was to ride on horseback, the use of carriages being considered effeminate.

Coaches became more common in the fifteenth century, but even then were regarded exclusively as vehicles for women and invalids. Later on they became, especially in Germany, part of the appendages of royalty. They seem to have been introduced

Stage Coach of Queen Elizabeth

into England about the middle of the sixteenth century, but were for long confined to the aristocracy and the wealthy classes. Hackney-coaches were first used in London in 1625. They were then only twenty in number, and were kept at the hotels, where they had to be applied for when wanted. In 1634 coaches waiting to be hired at a particular stand were introduced, and had increased to 200 in 1652, to 800 in 1710, and to 1000 in 1771.

Stage-coaches were introduced into England about the same time as hackney-coaches. The first stage-coach in London appears to have run early in the seventeenth century, and before the end of the century they were started on three of the principal roads in England. Their speed was at first very moderate, about 3 or 4 miles an hour. They could only run in the summer, and even then their progress was often greatly hindered by floods and by the wretched state of the roads generally. In 1700 it took a week to travel from York to London; in 1754 a body of Manchester merchants started a conveyance, the Flying Coach, of an improved kind, which did the journey to London in the unusually short period of four days and a half, and thirty years later a Mr. Palmer of Bath, after a considerable amount of opposition, succeeded in inducing the Government to put in practice certain suggestions which he made, by which he showed that great saving both of time and money in the conveyance of passengers and letters would be effected.

The result was the establishment of the system of mail-coaches, which continued to be the means of travelling in England until their place was taken by the railways. The first mail-coach started between London and Bristol on the 8th of Aug., 1784. Of coaches possessing a history the best known in the United Kingdom are the King's State coach (built in 1761), and that of the Lord Mayor of London (built in 1757).—BIBLIOGRAPHY: Sir W. Gilbey, *Early Carriages and Roads*; Ralph Strauss, *Carriages and Coaches: their History and their Evolution*.

COACH-DOG. A short-haired dog of moderate size, and rather handsome shape, white with numerous black spots, kept as an attendant upon carriages, and of no use otherwise. It is also called Dalmatian dog.

COADJU'TOR. A Latin term, nearly synonymous in its original meaning with *assistant*. The term is especially applied to an assistant bishop appointed to act for and succeed one who is too old or infirm for duty.

COAGULA'TION. The changing of a fluid into a more or less solid substance, or the separation of a substance from a solution, through the substance becoming more or less solid. Thus albumen of egg can be dissolved in cold water, but if the solution be warmed, the albumen undergoes a change, separates out in white flocky masses, and cannot again be redissolved in the water. Coagulation is well exemplified by the "curdling" of milk and "clotting" of blood.

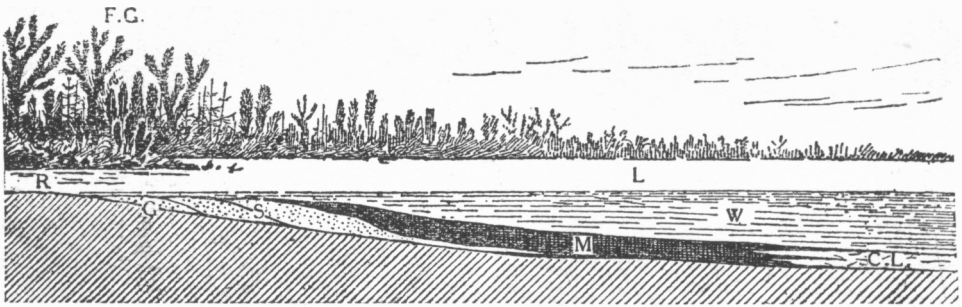
COAHUILA (kō-ä-wē'lä). A state of Mexico, on the frontier of the United States, rich in woods and pastures, and having several silver-mines; area, 63,786 sq. miles; pop. 434,310 (1930).

COAITAS. The South American spider monkeys, black in colour, and very docile in captivity. The prehensile tail is used as a fifth hand, and they are probably the most expert climbers among all their kind.

COAL. A solid, opaque, inflammable substance, mainly consisting of carbon, found in the earth, largely employed as fuel, and formed from vast masses of vegetable matter deposited through the luxuriant growth of plants in former epochs of the earth's history.

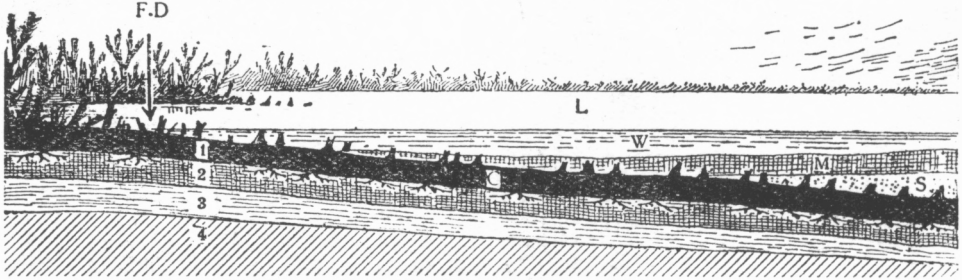
Vegetable Origin.—In the varieties of coal in common use the combined effects of pressure, heat, and chemical action upon the substance have left few traces of its vegetable origin; but in the sandstones, clays, and shales accompanying the coal, the plants to which it principally owes its origin are presented in a fossil state in great profusion, and frequently with their structure so distinctly retained as to enable the microscopist to determine their botanical affinities with existing forms. The great system of strata in which coal is chiefly found is known as the Carboniferous, and dates back to a time when the humbler types of vegetation predominated and grew to the size of forest trees. Lepidodendron and Sigillaria may be regarded as giant club-mosses, while Calamites is a large predecessor of the modern horse-tails.

Tree ferns also were prevalent; but many of these are now known to have been seed-bearing (pteridosperms), and thus to have foreshadowed later types of flowering plants. A few coniferous trees also occur. Coals formed from later types of vegetation occur in other systems, such as the Jurassic coal of



Coal Formation.—Fig. 1

Gravel, sand, and mud carried by river to bed of inland sea or lake. The heavy gravel falls first the sand is carried farther, and the mud farther still. When the increasing mud deposit emerged from the lake a new land surface was formed for vegetation, F.G.



Coal Formation.—Fig. 2

The lake having filled up, a forest grew over the whole area, and the vegetable matter was thus accumulated, and formed the beginning of a coal seam, 1. 2 s the mud, and 3 the gravel and sand which filled the first lake, 4 being the original bed of the first lake. In the mud of the first lake, 2, we have the roots of the first trees that grew in this underclay. The preserved stumps above the vegetable formation 1 are from the last trees that grew before the invasion of the second lake depicted in the diagram.

F.G., Forest growth. L, Surface of lake. W, Water. R, Mouth of river. G, Gravel. S, Sand. M, Mud.
C.L., Clean limestone. F.D., Slow decay of trees near edge of water; stumps preserved. C. Coal formation.

Sutherlandshire, and the Upper Cretaceous coal of Canada. Swampy ground or lagoon conditions seem essential for the preservation of large masses of decayed vegetation, and in many cases the coal-seams alternate with beds the fossils in which indicate marine incursions. There are numerous cases which testify to the decay of extensive forests and the preservation of their remains in place. Some brightly burning coals contain a good deal of muddy material, appearing in the ash on burning, and have been formed by the drifting of spores or decaying logs into swampy lakes. *See* BOGHEAD COAL.

Varieties of Coal.—There are many kinds of coal, varying considerably in their composition, as *anthracite*, nearly pure carbon, and burning with little flame, much used for furnaces and malt kilns; *bituminous* (popularly so called) or "household coal"; and *cannel* or "gas coal," which burns readily like a candle, and is much used in gas-making. The terms semi-anthracitic, semi-bituminous, caking coal, splint coal, etc., are also applied according to peculiarities. All varieties agree in containing from 60 to over 90 per cent. of carbon, the other elements being chiefly oxygen and hydrogen, and frequently a small proportion of nitrogen.

Lignite (q.v.) or *brown coal* (q.v.) may contain only 50 per cent. of carbon or less. For manufacturing purposes coals are generally considered to consist of two parts, the volatile or bituminous portion, which yields the gas used for lighting, and the substance comparatively fixed, usually known as *coke*, which is obtained by heating the coal in ovens or other close arrangements, and thus removing the volatile or smoke-yielding matter, while the main heating power of the coal still remains in the coke.

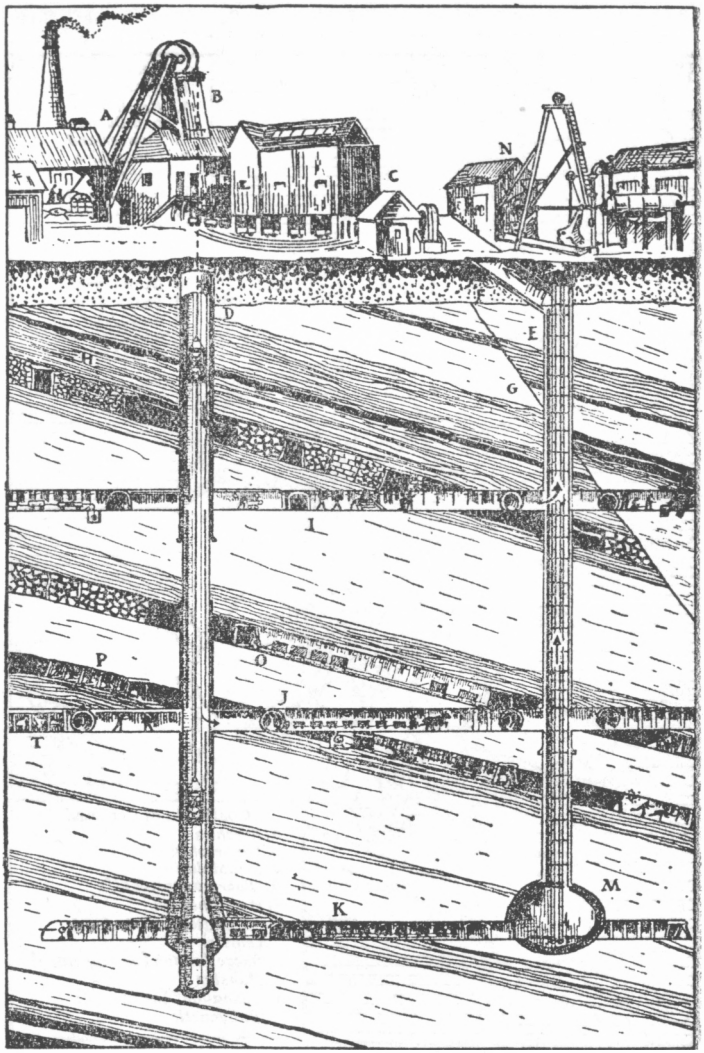
Coal Working.—Coal is the most valuable of all the minerals which contribute to the wealth of Great Britain, and it has been mined there for many centuries. The first charter giving liberty to the town of Newcastle-upon-Tyne to dig coal was granted by Henry III., A.D. 1239; in Scotland a charter was granted to the abbot and convent of Dunfermline in 1291 for the same purpose. The working of coal gradually but slowly increased, until, towards the end of the eighteenth century, the development of the steam-engine by James Watt enormously increased the use of coal, and made it the basis of Great Britain's industrial importance. From about 10,000,000 tons at the beginning of the nineteenth century, the annual output rose to five times as much by 1850, and in 1913 the total was 287,430,473 tons of coal, value £145,535,669. In 1927 the world's production of coal was 1282 million tons, and the annual output in the United Kingdom 260,000,000 tons.

The English coal-fields are by no means limited to the areas that appear on geological maps, considerable bodies of coal-bearing strata being concealed by younger deposits, to which, indeed, they owe their preservation. In Scotland and in Ireland, except in Tyrone, the coal-fields are bounded by older strata, and are thus more clearly defined. Coal forms one of the most important features of the British export trade; but coal, also of Carboniferous age, is largely mined in Belgium, in Northern and South-Eastern France, and in Westphalia and Silesia, while the Ukraine region of South Russia includes one of the largest coal-fields of the world.

The United States have become coal-producers on an enormous scale notably from the anthracite beds of Pennsylvania. Extensive fields are undergoing development in India, in New South Wales, and in China The coal of Canada is of Carboniferous age in the east, and of Cretaceous age in the west. Since Stanley Jevons called attention to the economics of coal production in 1865, various Commissions have made calculations as to the rate of depletion of British and other coal-fields.

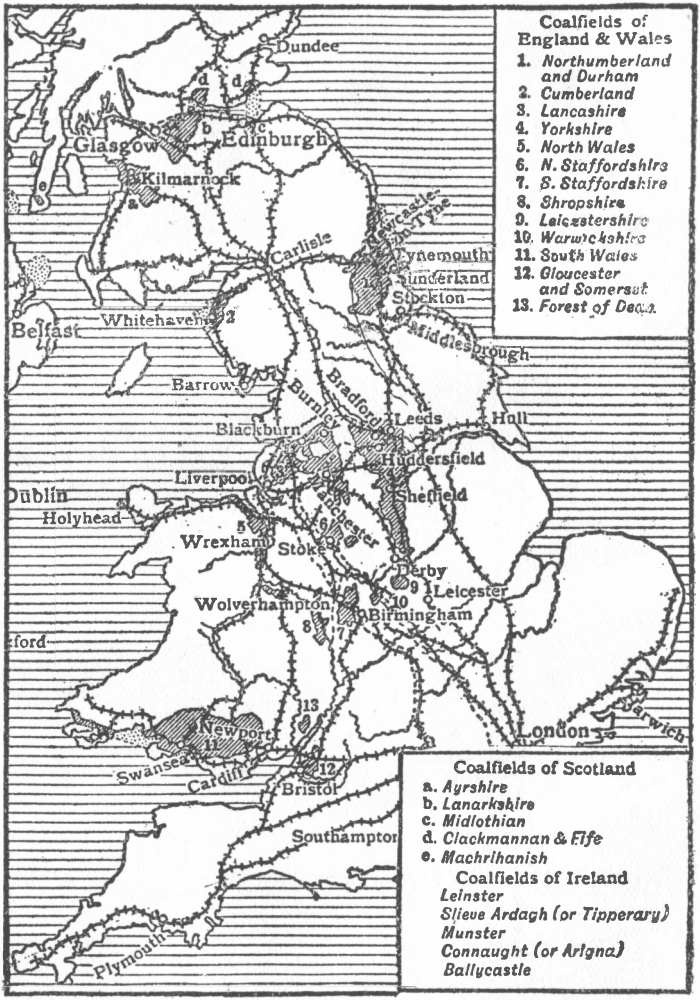
The question is an extremely serious one; but the first reform must be towards economy in use especially by the avoidance of waste in industrial operations. The darkened air that converts large English and Scottish areas, to speak of other lands, into veritable "Black Countries" manifests a disregard for the future that can only be checked by co-operative and even national action. Considerable hopes of conservation are based on the erection of central power-stations, from which the energy contained in coal may be transmitted as electricity to distant areas. *See* special articles on COAL-TAR; COKE; COKE-OVENS; and MINING.—BIBLIOGRAPHY: H. Hughes, *Text Book of Coal-mining*; E. A. N. Arber, *Natural History of Coal* (Cambridge Manuals of Science); F. H. Wilson, *Coal: its Origin, Method of Working, and Preparation for Market*; G. R. Kerr, *Practical Coal-mining*.

COALBROOKDALE. An English coal- and iron-producing district in Salop, along the bank of the Severn



SURFACE MACHINERY AND SECTION OF SHAFTS AND WORKINGS

A, Winding-engine house, controlling cage-raising and lowering machinery. B, Shaft head. C, Fan and engine for ventilating mine. D, Downcast shaft. E, Upcast shaft. F, Draft to fan. G, Line of fault. H, Goaf or worked seam filled in. I, Main roadway; men with props repairing roof. J, Main roadway; pit pony drawing empty corves (wagons). K, Main Roadway. M, Sump with pipes from surface pumps for draining mine. N, Power house for pumps. O, Trucks hauled up incline by cable. P, Miners at work in enclosed seam. T, Stalls for pit ponies. Arrows show the direction of ventilating current.



PRINCIPAL COALFIELDS IN BRITAIN

COAL-CUTTING MACHINE. Any machine for cutting out coal in the pit, the chief objects they are intended to serve being the cheapening of the work, the saving of a large quantity of coal, which in the ordinary process of holing by hand-labour with the pick is broken up into slack and dust, and the removal of the danger attending upon the employment of hand-labour. The instruments of excavation in these machines are variously constructed, and the actuating power is now commonly electricity.

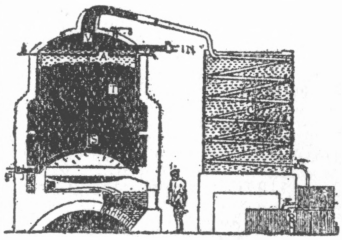
COAL-FISH. A species of the cod genus (*Gadus virens*), named from the colour of its back. It grows to the length of 2½ feet, and is found in great numbers about the Orkneys and the northern parts of Britain. In Scotland it is generally known as the *Scath* or *Saith*.

COALING - STATIONS. Stations established by the British Government at various important points throughout the empire, where the ships, both of the navy and the mercantile marine, may obtain supplies of coal. The utility of such stations, when properly fortified, as points of refuge, defence, and repair for British ships in the event of war, can hardly be overestimated. They include Gibraltar, Malta, Perim, Aden, Colombo, Singapore, Hong-Kong, Sierra Leone, St. Helena, the Cape, Mauritius, Newcastle (N.S.W.), Hobart, Wellington, the Falklands, and Halifax.

COALITION. A term used in diplomacy and politics to denote a union between different parties not of the same opinions, but who agree to act together for a particular object. Of the various coalition ministries in English history, those of Fox and North in 1782, of the Whigs and the Peelites in 1852, of the Liberal Unionists and Conservatives in Lord Salisbury's Cabinet in 1895, of Mr. Asquith in 1915, and of Mr. Lloyd George in 1916 and 1919 may be instanced. Amongst States it is understood to mean theoretically something less general in its ends and less deeply founded than an *alliance*.

COAL-MEASURES. The upper division of the Carboniferous system, consisting of beds of sandstone, shale, etc., between which are coal-seams.

COAL-TAR, or GAS-TAR, and COAL-TAR DISTILLATION. Coal-tar is a thick, black, strong-smelling liquid, heavier than water, which is obtained in the process of coal carbonization in gas-works and coke-ovens. It is a complex mixture of substances which are separated by distillation. In the early days of the manufacture of gas for lighting, the tar was considered useless. Its value became recognized when Perkin, in 1856, discovered the aniline dye mauveine, the pioneer of a famous series. Aniline is derived from benzene, one of the numerous by-products of coal-tar distillation.



Coal-tar Distillation Plant

IN. Supply-pipe to fill still. T, Tar boiling. A, Ammoniacal water. V, Vapour to condensing coil C. S, Steam to finish operation. P, Pipe to run off pitch. R, Receivers for different oils.

The distillation plant usually consists of a concave-bottomed vertical wrought-iron cylinder, set in a furnace. The tar is fed into the top of the still, and the residual pitch withdrawn below. Vapours are conveyed by a swan-neck at the top of the still to the condenser, where condensed liquids are collected in receivers some distance away from the still, as a precaution against fire.

Hot from previous working, the still is charged with fresh tar and the distillation carefully started. Substances of lower boiling-point will be vaporized first, followed by those with higher boiling-points, and by changing receivers at different temperatures, indicated by a thermometer at the top of the still, the coal-tar may be separated into fractions of different boiling-points. From 270° C. upwards the distillation is done in vacuum in the presence of superheated steam. The following table shows the fractions obtained :—

Name of Fraction.	Temperature of Distillation.	From Gas-works Tar.	From Coke-oven Tar.	Specific Gravity.
1. Light oils . .	Up to 170° C.	2–8 per cent.	2·3 per cent.	0·9–0·95
2. Middle oils . .	170°–230° C.	8–10 ,,	10 ,,	1·01
3. Heavy oils . .	230°–270° C.	8–10 ,,	12 ,,	1·04
4. Anthracene oils .	270°–360° or 400° C.	16–20 ,,	4 ,,	1·1
5. Pitch . . .	Above 360° C.	50–60 ,,	67 ,,	—

Treatment of the Fractions.—1. Light oils, b.-p. up to 170° C. This fraction is allowed to stand, watery fluid withdrawn, and remaining oils redistilled, any residue at 170° C. being added to the middle oils.

To remove bases, phenols, sulphur compounds, unsaturated hydrocarbons, etc., the oils are now washed with ½-1 lb. of concentrated sulphuric acid per gallon. The acid layer is drawn off and worked for ammonia and other bases. The oils are now washed with water, and then with 10 per cent. caustic soda solution, again with water, and are then dried and distilled into the following portions: (*a*) First runnings up to 70° C., which contain carbon bisulphide, heptane, hexane, etc.; (*b*) 90 per cent. benzol up to 110° C.; (*c*) 50 per cent. benzol up to 140° C.; (*d*) solvent naphtha up to 170° C.

The benzol fractions may be further distilled to obtain pure benzene, b.-p. 80° C.; toluene, b.-p. 110° C.; xylene, b.-p. 138-143° C. Pure and crude benzol is used in the dye industry, as a solvent in dry cleaning, and as a substitute for petrol in motor-engines.

Solvent naphtha may be redistilled, yielding about 25 per cent. best naphtha, and beyond 140° C. burning naphtha. It is used as a rubber solvent, as a paint thinner, and as a cleansing agent.

2. The middle oils, b.-p. 170-230° C. When these are being collected, the cooling water is allowed to rise to 60° C. to keep the condensate liquid, otherwise it would solidify and choke the cooling oil. This fraction is the raw material for phenol and naphthalene.

The oils are allowed to solidify and deposit naphthalene, which is separated by centrifuging and pressing. The mother liquor contains 30-40 per cent. phenol, and is treated with 10 per cent. caustic soda solution, dissolving phenols and cresols. This solution is run off, neutralized by carbon dioxide or sulphuric acid, the inorganic salts allowed to settle, and the separated phenols are distilled. The distillate is allowed to deposit its phenol, which is separated from the liquid mixture of isomeric cresols by centrifuging, yielding pure white crystalline phenol, m.-p. 42° C. The liquid cresols are used for disinfecting. Any oil insoluble in alkali is added to the middle oil fraction for reworking.

The crude naphthalene crystals are washed with alkali to get rid of phenols, etc., treated with concentrated sulphuric acid, and distilled. Naphthalene is a white volatile solid with peculiar smell, m.-p. 79° C., b.-p. 217° C., insoluble in water, soluble in organic solvents, and yields a large series of dyes. It is also used as a camphor substitute and burnt for lamp-black.

3. The heavy or creosote oils, b.-p. 230-270° C. These oils are a complex mixture and are rarely worked up, but are used as a timber preservative.

4. The anthracene or green oils, b.-p. 270-360° C. *See* ANTHRACENE.

5. Pitch. The residue at 360° C. is "soft pitch," and contains 20 per cent. unsaturated hydrocarbons. It may be distilled further to a "hard pitch" or to a coke. Pitch is used for briquetting, paints and varnishes, and street paving.

Yields.—The yield of putrified products from tar is about as follows:—

	Per cent.
Benzene and toluene	0·22
Xylene and solvent naphtha	0·62
Phenol	0·4
Cresols	1·13
Naphthalene	6·4
Anthracene	0·44

6. Pyridine bases. The sulphuric acid washings from the light oils are impregnated with ammonia until two layers are obtained, and the lower layer of pyridine-ammonium sulphate solution is drawn off and saturated with ammonia. The pyridine separates out, is drawn off, and fractionated.

Quinoline, picoline, lutidine, are similarly obtained, especially from acid washings of the heavy tar oils.

COALVILLE. A town (urban district) of England, Leicestershire, 12 miles N.W. of Leicester, on the west side of Charnwood Forest, with extensive coal-mines, railway-wagon works, etc. Pop. (1931), 21,886.

COAMINGS. Raised frames rather higher than the deck, about the edges of the hatch-openings of a ship, to prevent the water on deck from running down.

COAN'ZA. A large river of Southern Africa, Lower Guinea, entering the Atlantic near 9° 10′ S.

COAST-GUARDS. A British force since 1925 under the Board of Trade, and now primarily a life-saving service. It was formerly under the Customs Department, and intended only to prevent smuggling, but later was organized also for purposes of defence and governed by the Admiralty. The men, since 1857, always are old men-of-war's men of good character. The force numbers 813, all ranks.

COASTING-TRADE. Trade carried on by sea between the ports of the same country. The term usually includes also the trade between the mother country and its colonies. Since 1854 the coasting-trade of Great Britain is open to foreign vessels, but power is given to the king to impose by an order in Council retaliatory prohibitions and restrictions on the ships of such countries as impose restrictions and prohibitions on British ships. In other countries the coasting-trade is generally retained as a home monopoly. In the United States the coasting-trade is restricted to ships built and owned in the country, as well as officered and manned by Americans.

COAST MOUNTAINS, or **COAST RANGE.** A range or series of ranges extending along the west of California at no great distance from the Pacific coast, and rising to the height of 8500 feet.

COATBRIDGE. A burgh in Scotland, Lanarkshire, 9 miles E. of Glasgow. The district abounds in coal and ironstone, and the place has rapidly grown from a trifling village to a thriving town, supported chiefly by the ironworks and engineering establishments in the neighbourhood. Since the redistribution of 1918 Coatbridge gives its name to a parliamentary division of the county. Pop. (1931), 43,056.

CO'ATI, or **COATI-MONDI.** A name of South American plantigrade carnivorous mammals of the genus Nasua, belonging to the raccoon family (Procyonidæ), and distinguished by the possession of a long proboscis or snout. They feed on worms, insects, and the smaller quadrupeds, but chiefly on eggs and young birds.

COAT OF ARMS. Heraldic achievement of an individual or community. It is borne on a shield or escutcheon, generally with crest and motto, and sometimes badge and supporters. Their use, fostered by the need for distinguishing warriors when acting together, especially during the Crusades, expanded rapidly. The practice of embroidering them on the surcoat over the armour originated the term coat of arms.

Arms are granted in England by the College of Arms and in Scotland by the Lyon King-at-Arms. Fees amounting to over £100 are charged. Corporations, schools, and other corporate bodies can obtain coats of arms in the same way.

COAT OF MAIL. Armour consisting of a network of iron or steel rings, or of small plates, usually of tempered iron, laid over each other like the scales of a fish, and fastened to a strong linen or leather jacket.

COATS. Name of a famous Scottish family. James Coats began to make thread at Paisley before 1800, and the business was continued by his sons, Peter and Thomas. It soon became the largest of its kind in the world. In 1890 it became a public company and absorbed the rival firms of Clark, Chadwick, and others. Peter Coats (1808-90) had a son, James, who, in 1905, was made a baronet. Of the sons of Thomas Coats (1809-83) one became Sir Thomas Glen-Coats, Bart. (1846-1922), and another, George (1849-1918), became Baron Glentanar.

COBÆA. A genus of Polemoniaceæ, natives of tropical America. *C. scandens* is a very quickly growing tendril-climber, often grown in greenhouses or on arbours. Its tendrils, which branch freely and end in sharp hooks, are very sensitive to contact. The flowers, which are large and bell-shaped, on first opening are greenish with an unpleasant odour, but later turn purple and emit a pleasant scent.

CO'BALT (Ger. *kobalt, kobolt,* the same word as *kobold,* a goblin, so called by miners because cobalt ores were a trouble in the workings, their value not being known). A metal with the symbol Co, specific gravity 8·5, of a greyish-white colour, very brittle, of a fine close grain, compact, but easily reducible to powder; found chiefly in New Caledonia, and in Ontario Province, Canada. It crystallizes in parallel bundles of needles. It is never found in a pure state, but is extracted from the following ores: *smaltine,* a heavy grey diarsenide of cobalt, iron, and nickel; *cobaltine,* sulphide and arsenide of cobalt, crystallizing like pyrite, but in colour tin-white with a touch of pink. The hydrous arsenate *erythrine* or *cobalt-bloom* forms delicate pink crusts, and thus calls attention to the grey arsenical ores. Black cobalt oxide occurs in conjunction with manganese oxides in some swamp deposits; this form of wad is called *asbolan.* The great use of cobalt is to give a permanent blue colour to glass and to enamels upon metals, porcelain, and earthenware.

COBALT. A town, Ontario, Canada, on Cobalt Lake. Mining is the chief industry, the district being the richest silver area in the world. Pop. 3885.

COBALT-GREEN. A permanent green pigment prepared by precipi-

tating a mixture of the sulphates of zinc and cobalt with carbonate of sodium, and igniting the precipitate after thorough washing.

COBAN', or **VEAR PAZ.** A cathedral city and state of Guatemala. Pop. 26,774.

COBAR. An inland town of New South Wales, 459 miles by railway N.W. of Sydney, in a district rich in copper and gold; well equipped with churches and schools. The Great Cobar mine is the chief coppermine in the state. Pop. 4619.

COBBE, Frances Power. Authoress, born (near Dublin) 1822, died 1904; took a strong interest in humanitarian movements and especially in that against vivisection; wrote works of travel and others dealing with theological and humanitarian questions, including *Essay on Intuitive Morals, Pursuits of Women, Darwinism in Morals, The Hopes of the Human Race Hereafter and Here, The Scientific Spirit of the Age, The Modern Rack,* and *Papers on Vivisection.*

COB'BETT, William. English writer and politician, was the son of a farmer and publican at Farnham, in Surrey, and born there on 9th March, 1766. In 1783 he made his way to London and obtained a situation as copying-clerk to an attorney, but after nine months he enlisted in the 54th Foot, and shortly after went with the regiment to Nova Scotia. His regular habits and attention to his duties soon brought him promotion, and he was sergeant-major when the regiment four years after returned to England (1791).

During his service in the army Cobbett had employed all his spare time in improving his education. He now obtained his discharge, married, and proceeded to America to commence as a political writer. Under the signature of *Peter Porcupine* he wrote papers and pamphlets of a strongly anti-Republican tendency. In June, 1800, he sailed for England, and on his arrival started first *The Porcupine,* a daily paper, which had small success, then the *Weekly Political Register,* which soon acquired a great circulation. *The Register* had started as a Tory paper in support of Pitt, but gradually changed its politics till it became known as the most daring and uncompromising of the Government's opponents. Three times heavily fined for libel, Cobbett continued his attacks on the Government, in consequence of which he deemed it prudent to retreat to the United States (1817), transmitting his articles regularly, however, for *The Register.*

In 1819 he returned to England, and made an unsuccessful attempt to get into Parliament for Coventry. About the same period he commenced a series of papers entitled *Rural Rides,* afterwards reprinted, which contain charming pictures of English country scenery, and are among the best of his productions. Between 1824 and 1827 appeared his *History of the Reformation,* in which he vilified Queen Elizabeth and the leading reformers. On the passing of the Reform Bill in 1832 he was returned as member for Oldham, but was indifferently successful in the House. He died 18th June, 1835.

Cobbett is also the author of a *Parliamentary History of England from the Conquest to 1803, Advice to Young Men and Women, A Geographical Dictionary of England and Wales, History of the Regency and Reign of George IV.,* and *Village Sermons.* He wrote in a pure and vigorous English style, and his writings contain much useful information, and show a sound judgment wherever the matter did not go beyond his strong practical sense. In 1798 he published in America an account of his early life, under the title of *The Life and Adventures of Peter Porcupine.* — BIBLIOGRAPHY: E. Smith, *Life of Cobbett*; R. Huish, *Life of Cobbett*; Lewis Melville, *The Life and Letters of William Cobbett in England and America.*

COB'DEN, Richard. English politician, the "apostle of free trade," born in Sussex 3rd June, 1804, died in London 2nd April, 1865. After receiving a very meagre education, he was taken as an apprentice into a warehouse in London belonging to his uncle, and in this situation he rapidly made up for the defects of his education by his own diligence. In 1830, being left by the failure of his uncle to his own resources, along with some relatives he started a cotton manufactory in Manchester, which in a few years was very successful.

His first political writing was a pamphlet on England, Ireland, and America (1835), which was followed by another on Russia (1836). In both of these he gave clear utterance to the political views to which he continued through his life rigidly to adhere, advocating non-intervention in the disputes of other nations, and maintaining it to be the only proper object of the foreign policy of England to increase and strengthen her connections with foreign countries in the way of trade and peaceful intercourse.

Having joined the Anti-Corn Law

League, formed in 1838, it was chiefly the extraordinary activity of Cobden, together with Bright and other zealous fellow-workers, which won victory for the movement. In 1841 Cobden entered Parliament as member for Stockport, and after several years of unwearied efforts at last induced Sir Robert Peel, then Prime Minister, to bring in a Bill for the repeal of the Corn Laws, a measure which became law in 1846. Next year he was chosen member for the W. Riding of York, a constituency which he represented for ten years. His business, once highly prosperous, had suffered while he devoted himself to the agitation, and as a compensation for the loss he had thus sustained a national subscription was made, and a sum of about £70,000 presented to him.

Cobden continued his labours as an advocate of parliamentary reform, economy, and retrenchment, and a policy of non-intervention, in all of which he found a firm and ready ally in Bright, both being strong opponents of the Crimean War. In 1859 he was chosen member for Rochdale, and was offered, for the second time, a place in the Government, but again preferred to keep his independent position. He refused also a baronetcy and several other dignities.

His last great work was the commercial treaty which he was the means of bringing about between Britain and France in 1860. During his later years he lived a good deal in retirement. His speeches were collected and published in 1870. *See* FREE TRADE; TARIFF REFORM; CORN LAWS.—BIBLIOGRAPHY: John Morley, *Richard Cobden's Life*; W. E. A. Axon, *Cobden as a Citizen: a Chapter in Manchester History*; *Cobden's Speeches on Questions of Public Policy*, edited by John Bright and J. E. Thorold Rogers.

COBDEN CLUB. An association formed in London in 1866, mainly by the influence of Bright and T. B. Potter, for the purpose of encouraging the growth and diffusion of those economical and political principles with which Cobden's name is associated. The Cobden Club has distributed a vast number of books and pamphlets.

COBH. *See* QUEENSTOWN.

COBHAM. Village of Surrey, sometimes called Church Cobham. It stands on the Mole, 17½ miles from London, on the Southern Railway. There are an old church and a water-mill 700 years old. Pop. 6000.

Another Cobham is a village in Kent. It is 5 miles from Gravesend and has an old church with some notable crosses. There was a college of priests here in the fourteenth century, and there are remains of this, as well as some sixteenth-century almshouses.

COBHAM, Sir Alan John. English airman. Born, 6th May, 1894, he was educated at Camberwell. He went to France in 1914 and in 1917 received a commission in the Air Force. When peace came he joined an aircraft firm. Among his long flights were those from London to Rangoon and back, 1924; London to Cape Town and back, and London to Australia and back, 1926. He won the King's Cup in 1924, the Britannia Trophy in 1925 and 1926, and was commander pilot of the first flying boat expedition round Africa. Knighted in 1926, he has published several books on his experiences.

COBHAM, Viscount. English title. It dates from 1718, when Sir Richard Temple of Stowe was made a viscount. His sister, the wife of Richard Grenville, succeeded to the viscountship, which passed to her descendants, the Earls Temple, afterwards created Marquess and Duke of Buckingham. In 1889, when the last Duke of Buckingham died, the viscountship passed to a distant relative, the 5th Baron Lyttleton, a descendant of a sister of the 1st viscount.

Lord Lyttleton, who then became the 8th Viscount Cobham, was a noted cricketer. He died in 1902, when his son, James Cavendish Lyttleton, became the 9th viscount. The family seat is Hagley Hall, Worcestershire.

There is a barony of Cobham revived in 1916 for a member of the Alexander family.

COBIJA (kō-bē'hà), or **PUERTO LA MAR.** A seaport formerly belonging to Bolivia, now in the territory of Antofagasta, Chile. Pop. about 5000.

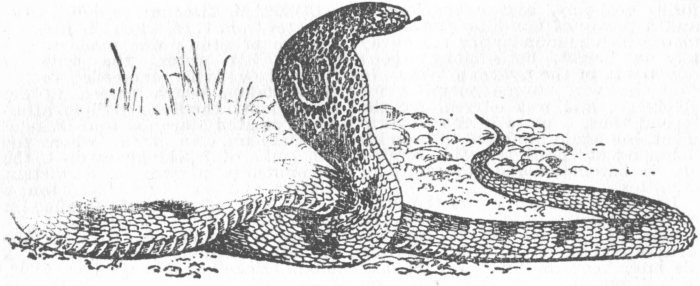
COB'LENZ (anciently Confluentes, from its situation at the confluence of the Rhine and Moselle). A fortified town of Germany, capital of Rhenish Prussia, finely situated on the left bank of the Rhine in the angle between it and the Moselle, and connected by a pontoon-bridge over the Rhine with the fortress of Ehrenbreitstein; this, along with its other fortifications, rendered it one of the strongest places in Germany, and capable of accommodating 100,000 men.

The new part of the town is well built, with broad streets and fine squares. Its industries include cigars,

machinery, champagne-wines, pianos, and it has an important trade in Rhine and Moselle wines. Bombed during the European War in 1917 and 1918, the town was occupied by American troops after the armistice. Pop. 56,487.

COBOURG. A port of Canada, province of Ontario, on Lake Ontario, 69 miles E. by N. of Toronto. It is well built, has sundry manufactures, a good harbour, and an increasing trade. Pop. 5834.

COBRA DE CAPELLO (that is, "snake of the hood"). The Portuguese name of the hooded or spectacled snake *Naja tripudians*, which is found in Southern Asia, a closely allied species (*Naja haje*), also called cobra, or asp, being found in Africa. It is called "spectacled snake" from



Cobra de Capello

a singular marking on the back of the neck, while its other name is given from the remarkable manner in which it spreads out the skin on the sides of the neck and head when disturbed or irritated, raising the anterior part of its body so as to appear to stand erect, and expanding its hood.

So exceedingly poisonous is its bite, that in numerous instances death has followed within a few minutes, and under ordinary circumstances a few hours is the longest term where prompt measures have not been taken. But, indeed, recovery rarely takes place, though injection of potash into the veins is said to be a remedy. A special serum, prepared from cobra poison, has been tried with good effect, but this is rarely at hand when wanted. In India thousands of natives lose their lives yearly through cobra bites. Its food consists of small reptiles, birds, frogs, and fishes—it is an excellent swimmer. Its great enemy is the ichneumon. It is one of the snakes exhibited by snake-charmers.

CO'BURG. A town, Germany, capital of the former duchy of Saxe-Coburg-Gotha, finely situated on the left bank of the Itz, 106 miles E. by N. of Frankfort-on-the-Main. The town is mentioned for the first time in 1207. The principal buildings are the palace of the former Duke of Saxe-Coburg-Gotha, and, on an eminence overhanging the town, the ancient castle of the Dukes of Coburg, in which are still shown the rooms occupied by Luther during his concealment here in 1530. Coburg has various manufactures, also extensive breweries. Pop. 24,701.

COBURG. *See* BAVARIA.

CO'BURG. A thin fabric of worsted and cotton, or worsted and silk, twilled on one side, for ladies' dresses, intended as a substitute for merino.

COBURG PENINSULA. A peninsula on the north coast of Australia, in the Northern Territory.

COCA (*Erythroxylon Coca*). A South American plant, nat. ord. Erythroxyleæ. The leaf is a stimulating narcotic, and is chewed by the inhabitants of countries on the Pacific side of South America, mixed with finely powdered chalk. It has effects somewhat similar to those of opium. A small quantity of it enables a person to bear up against fatigue even when receiving less food than usual; and it prevents the difficulty of respiration experienced in climbing high mountains. Used in excess it brings on various disorders, and the desire for it increases so much with indulgence that a confirmed coca-chewer is said never to have been reclaimed.

Coca-leaves depend for their in-

fluence on a crystallizable alkaloid called *cocaine*, which, besides having effects similar to the leaf, possesses valuable anæsthetic properties, and is often employed to prevent suffering in operations on the eye, having also similar effects when applied to the tongue, larynx, ear, etc., the mucous membrane being readily affected by it. Injected into the gum round a tooth it will so lower the sensibility that the tooth can be extracted without pain. It is also used by hypodermic injection.

Coca wine, wine containing the drug, is in common use as a stimulant, and is often abused, the cocaine habit being as readily acquired as that of taking morphia or alcohol. The annual production of leaves in the South American trade is estimated at about 40,000,000 pounds.

COCAINE (kō'ka-in). *See* COCA.

COCANA'DA. A town of India, on the coast of Madras, at the north-east angle of the Godavari delta, connected with the railways of Southern India and by the coast-line with Calcutta; the chief port on this coast next to Madras, exporting rice, cotton, sugar, and oil-seeds. Pop. 53,348.

COCCOS'TEUS. A typical "buckler ed ganoid" or placoderm fish of the Old Red Sandstone period. Two heavy, bony cuirasses, bearing small tubercles, surround the head and the forepart of the body, the remainder of which is unprotected. Two lateral bones are regarded as swimming-fins. The vertebræ were cartilaginous, and have left no traces, except bony spines above and below.

COC'CULUS. A genus of East Indian Menispermaceous plants, consisting of climbers with heart-shaped leaves and small flowers. The berries called *Coccŭlus Indicus* belong to an allied plant, *Anamirta paniculata*; they contain a powerful convulsive poison, picrotoxine, which is used medicinally.

COCCUS. A genus of insects of the ord. Hemiptera, family Coccidæ, or scale-insects. The males are elongated in their form, have large wings, and are without any obvious means of suction; the females, on the contrary, are of a rounded or oval form, about an eighth of an inch in length, have no wings, but possess a beak or sucker, by which they suck up the juices of the plants on which they live. At a certain period of their life the females attach themselves to the plant or tree which they inhabit, and remain thereon immovable during the rest of their existence. In this situation they are impregnated by the male; after which their body increases considerably, in many species losing its original form and assuming that of a gall, and, after depositing the eggs, drying up and forming a habitation for the young.

Some of these insects are troublesome in gardens, plantations, and hot-houses, while others are of great value. For example, kermes, cochineal, lac-lake, lac-dye, and gum-lac are either the perfect insects dried, or the secretions which they form. Kermes consist of the dried females of *Coccus ilicis*, found in great abundance upon a species of oak (*Quercus coccifĕra*), a native of the Mediterranean basin, and gathered before the eggs are hatched. It was known as a dyestuff in the earliest times, but has partly fallen into disuse since the introduction of cochineal.

Cochineal consists of the bodies of the females of the *Coccus cacti*, a native of Mexico, which feeds on various species of cactus, particularly on one called *nopal* (*Opuntia coccinellifĕra*). The "ground pearls" of St. Vincent are the encysted pupæ of similar insects, and the manna of the Bible was probably the sticky excretion (honeydew) of *Coccus* (*Gossyparia*) *mannifera*, that lives on tamarisk in parts of the Mediterranean region.

COCCYX (kok'siks). In anatomy, an assemblage of small bones attached to the lower extremity of the backbone. It is the homologue in man of the tail in animals.

COCHABAM'BA (koch-). A town in the interior of Bolivia, capital of the department of Cochabamba, situated in a fertile valley 8435 feet above the level of the sea, with a good trade and considerable manufactures. Pop. 36,000. The department has an area of 25,288 sq. miles. Pop. 542,735.

COCH'IN. A seaport, India, Malabar district, Madras Presidency, on a small island; a picturesque place with many quaint old Dutch buildings. Its harbour, although sometimes inaccessible during the south-west monsoon, is the best on this coast. Its trade, however, has for some years been declining. Cochin was one of the first places in India visited by Europeans. In 1502 Vasco da Gama established a factory, and soon after Albuquerque built a fort; he also died here in 1524. In 1663 the Dutch took the place, in 1795 the British. Pop. 20,637.

COCH'IN. A small native state of India, on the south-west or Malabar coast, connected with the Presidency of Madras, intersected by numerous

rapid streams descending from the Western Ghauts, and having several shallow lakes or backwaters along the coast. Chief products: timber, rice. The rajah has to pay £20,000 annually to the Indian Government. Area, 1418 sq. miles; pop. 1,205,016, of whom many were Christians, partly belonging to the Jacobite and Nestorian Churches established there in early times. The capital is Ernakolam. Formerly Cochin was the capital, a town on the Travancore estuary, within half a mile of the British town of Cochin.

COCHIN-CHINA. A country forming part of the peninsula of South-Eastern Asia, and sometimes regarded as including the whole of Annam. Lower or French Cochin-China (Cochin-China proper) belonged to Annam till, in 1863, a portion of it was finally ceded to France after a war occasioned by the persecution of French missionaries; another portion being declared French territory in 1867. The territory thus acquired covers 26,476 sq. miles, and has a pop. of about 4,392,886 (1929). It is now divided into twenty provinces, each administered by a French officer.

The northern and eastern parts are hilly, but the rest of the territory consists almost entirely of well-watered low alluvial land. In the low and wet grounds much rice is grown. In the more elevated districts are grown tobacco, sugar-cane, maize, indigo, and betel. Among the other products are tea, gums, cocoa-nut oil, silk, spices. The climate is hot and unsuited for Europeans.

Industrial arts are as yet limited among the natives. But they excel in the use of wood, of which their temples, pagodas, and tombs are built, being ornamented with elaborate carving. They live in villages adjacent to the rivers, which form almost the only means of communication. The only roads at present existing are those connecting Saïgon, the capital, with the principal towns; a railway, the oldest in Indo-China, connects Saïgon and Mytho.

The principal export is rice, mainly to China; cotton and silk are also exported. The export and import trade is most carried on by British vessels, while the local trade is chiefly in the hands of the Chinese. The French population numbers 16,462. The majority of the inhabitants are Annamese. In their monosyllabic language, their religious tendencies towards Buddhism or the system of Confucius, and in their social customs they much resemble the Chinese.

Upper Cochin-China is the name sometimes given to the narrow strip of land on the east coast of Annam between the mountains and the sea, extending from Tonquin on the north to Champa on the south, or from about 18° to 11° N.—BIBLIOGRAPHY: Baurac, *La Cochinchine et ses habitants*; P. Nicolas, *La vie française en Cochinchine*; Charles William Louis, Duke of Södermanland, *In the Lands of the Sun*.

COCHIN-CHINA. A term applied to a variety of the domestic fowl, first imported from Cochin-China about 1843. It is a large ungainly bird, valuable chiefly owing to its fecundity, eggs being laid even during the winter. *See* POULTRY.

COCHINEAL (koch'in-ēl). A dyestuff consisting of the dried bodies of the females of a species of insect, the *Coccus cacti* (*see* COCCUS), a native of the warmer parts of America, particularly Mexico, and found living on a species of cactus called the cochineal-fig (*Opuntia* [*Nopalea*] *coccinellifĕra*). The insects are brushed softly off, and killed by being placed in ovens or dried in the sun, having then the appearance of small berries or seeds.

There are three grades, known as "silver-grey," "black," and "granilla." A pound of cochineal contains about 70,000 of them. The finest cochineal is prepared in Mexico, where it was first discovered, and Guatemala; but Peru, Brazil, Algiers, the East and West Indies, and the Canary Islands have also entered into this industry, which the aniline dyes have greatly injured. Cochineal produces crimson and scarlet colours, and is used in making carmine and lake.

COCHINEAL-FIG. A name given to *Opuntia* (*Nopalea*) *coccinellifĕra* and two other species of cacti, natives of Mexico and the West Indies, the plants on which the cochineal insect lives.

COCHLEA (kok'lē-a). An important part of the internal ear, so called from its shape, which resembles that of a snail-shell. It is the real organ of hearing, the instrument in which the mechanical effects produced by sound-waves stimulate the auditory nerve and start impulses that pass to the brain, and so excite a consciousness of hearing.

COCHLEARIA (kok-lē-ā'ri-a). A genus of Cruciferous plants, including the horse-radish and common scurvy-grass.

COCHRAN, Charles Blake. English showman. Born in Sussex, 25th Sept., 1872, he went to the United

States and became an actor. In New York he gained a good deal of experience about stagecraft and theatrical work generally, which he turned to good account on his return to London. He made a reputation by the spectacular display of *The Miracle* at Olympia in 1900 and its elaborate revival at the Lyceum in 1932, and was responsible for some important boxing and other contests. In 1925 he published *The Secrets of a Showman*.

COCHRANE (ko*h*'ran), **Lord.** *See* DUNDONALD.

COCKADE'. A plume of cock's feathers with which the Croats in the service of the French in the seventeenth century adorned their caps. A bow of coloured ribbons was adopted for the cockade in France, and during the French Revolution the tricoloured cockade—red, white, and blue—became the national distinction. National cockades are now to be found over all Europe.

COCKATOO'. The name of a number of climbing birds belonging to the sub-order of the parrots, or Psittacidæ, or regarded as forming a distinct family, Plictolophidæ or Cacatuidæ. They have a large, hard bill; a crest, capable of being raised and lowered at the will of the bird, commonly white, but sometimes yellow, red, or blue; a tail somewhat longer than that of the parrot, and square or rounded; long wings; and, for the most part, a white plumage, though in some genera the plumage is dark. They are found especially in the Eastern Archipelago and Australia. They live on roots, fruits, grain, and insects, and usually congregate in flocks.

These birds are easily tamed, and when domesticated become very familiar. The sulphur-crested cockatoo (*Cacatua galerita*) of Australia and Tasmania is a favourite cage-bird. So are the white-crested cockatoo (*C. alba*) and Leadbeater's cockatoo (*C. Leadbeateri*), the pink cockatoo, whose crest is barred with crimson, yellow, and white. A very striking form is the Great Black Cockatoo (*Microglossus aterrimus*) from North Australia and the Papuan Islands.

COCK'ATRICE. A fabulous monster anciently believed to be hatched from a cock's egg. It is often simply another name for the basilisk. *See* BASILISK.

COCKAYNE. Imaginary land. The "land of cakes," it was the favourite scene of mediæval French and Italian fables, sometimes by way of ridiculing the equally mythical Avalon, or Island of the Blest.

COCKBURN (ko'burn), **Sir Alexander James Edmund, Bart.** Lord Chief Justice of England, was born in 1802, his father being of Scottish extraction, his mother French; died in 1880. He was educated on the Continent and at Cambridge, was called to the Bar in 1829, went the Western Circuit for some years, became Q.C. in 1841, entered Parliament in 1847 as a Liberal, and took a high position there; in 1850 he was made Solicitor-General and knighted, and next year was made Attorney-General.

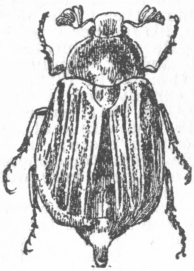
From 1852 to 1856 he was again Attorney-General, and took part in several famous trials. In the latter year he became Chief Justice of the Common Pleas; in 1858 he succeeded to the family baronetcy; in 1859 became Lord Chief Justice of England, holding this post at his death.

He was one of the three judges who tried the Tichborne claimant, Orton or Castro, and his summing up lasted eighteen days; he was also one of the arbitrators on the *Alabama* claims in the Geneva arbitration, and published a vigorous statement of his reasons for dissenting from the award of the majority.

COCKBURN, Henry Thomas, Lord. A distinguished Scottish judge, was the son of Archibald Cockburn, one of the barons of the Court of Exchequer, and born in 1779, died in 1854. He studied for the Scottish Bar, and was admitted a member of the Faculty of Advocates in 1800. He attached himself to the Liberal party, rose to eminence in his profession, and became, under Earl Grey, Solicitor-General for Scotland. He was a good example of the blending of wit, law, and learning common enough at the old Scottish Bar. His *Memorials of His Time* (published in 1856) is an invaluable record of the social history of Scotland. Not less interesting is his work *The Life of Lord Jeffrey*, published in 1852.

COCK'CHAFER. A species of lamellicorn beetle, genus Melolontha, remarkable for the length of its life in the worm or larva state, as well as for the injury it does to vegetation after it has attained its perfect condition. The common cockchafer (*Melolontha vulgāris*) is hatched from an egg which the parent deposits in a hole about 6 inches deep, which she digs for the purpose. At the end of about three months the insect emerges as a small grub or maggot, and feeds on the roots of vegetables in the vicinity with great voracity. When full grown it is over an inch

in length; it makes its way underground with ease, and commits great devastation on grass and corn crops. In the fourth year the insect appears



Common Cockchafer (*Melolontha vulgaris*)

as a perfect coleopterous insect—a beetle over an inch long, of a black colour, with a whitish down. It usually emerges from the ground about the beginning of May, from which circumstance the English name *may-beetle* has been given it. In its perfect state it is very destructive to the leaves of various trees.

COCKER. A small variety of spaniel named from its employment in tracking down woodcock. For work in coverts and hedges it is of great value.

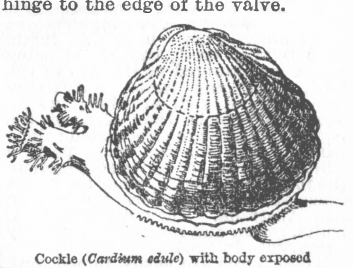
COCKER, Edward. An English engraver and teacher of writing and arithmetic in the seventeenth century, born in 1631, died 1675. His work *Cocker's Arithmetic*, upon which many succeeding treatises were framed, was published in 1678.

COCK'ERMOUTH. A town, till 1885 a parliamentary borough, in Cumberland, England, at the mouth of the Cocker, 25¼ miles S.W. of Carlisle. Cockermouth unites with Penrith in returning one of the four members for the county. It has an old ruined castle, supposed to have been built soon after the Conquest. Thread and tweeds are manufactured; and there are coal-mines in the neighbourhood. Cockermouth is the birthplace of the poet Wordsworth. Pop. (1931), 4789.

COCK-FIGHTING. An amusement practised in various countries, first perhaps among the Greeks and Romans. At Athens there were annual cock-fights, and amongst the Romans quails and partridges were also used for this purpose. It was long a favourite sport with the British, and the training, dieting, and breeding of cocks for fighting formed the subject of many treatises. The sport is now prohibited in Britain by 12 & 13 Vict. c. xcii. It is a favourite pastime with the Malays.—BIBLIOGRAPHY: G. Markham, *The Pleasures of Princes*; Sir W. Gilbey, *Sport in the Olden Time*: *Cock-fighting*.

COCK-LANE GHOST. An impudent hoax by which many Londoners were deceived in 1762, consisting in certain knockings heard in the house of a Mr. Parsons, in Cock Lane, Stockwell. Dr. Johnson was among those who believed in the supernatural character of the manifestations; but it was found out that the knockings were produced by the eleven-year-old daughter of Parsons.—Cf. A. Lang, *Cock-Lane and Common Sense*.

COCKLE. A name for the bivalve molluscs of the genus Cardium, especially *Cardium edule*, common on the sandy shores of Britain, and much used as food. The general characteristics are: shells nearly equilateral and equivalvular; hinge with two small teeth, one on either side near the beak, and two larger remote lateral teeth, one on either side; prominent ribs running from the hinge to the edge of the valve.



Cockle (*Cardium edule*) with body exposed

COCKLE-STOVE. A stove in which the fire-chamber is surrounded by air-currents, which, after being heated sufficiently, are admitted into the apartments to be warmed.

COCK'NEY. A nickname for a London citizen, as to the origin of which there has been much dispute. The word is often, but not always, employed slightingly as implying a peculiar limitation of taste or judgment. The epithet is as old at least as the time of Henry II. The Cockney School of Poetry was a nickname fastened upon a school of writers (Leigh Hunt, Keats, and Hazlitt) by John Gibson Lockhart.

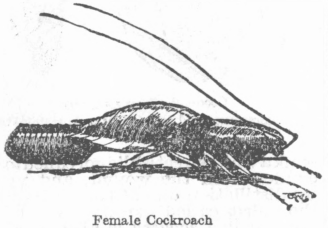
COCK OF THE PLAINS (*Centrocercus urophasiānus*), a large North American species of grouse, inhabiting desolate plains in the western states.

COCK OF THE ROCK (*Rupicŏla crocea*). A South American bird of a rich orange colour with a beautiful crest, belong to the manakin family.

COCK OF THE WOODS. *See* CAPERCAILZIE.

COCKPIT. In a man-of-war. A name formerly applied to the place where the wounded were dressed in battle or at other times, and where medicines were kept.

COCK'ROACH. The type of a family of insects belonging to the



Female Cockroach

orthopterous or straight-winged order, characterized by an oval, elongated, depressed body, which is smooth on its superior surface. They have parchment-like elytra, and in the female the wings are imperfectly developed. They are nocturnal in their habits, exceedingly agile, and devour provisions of all kinds.

Cockroaches, like other orthopterous insects, do not undergo a complete metamorphosis: the larvæ and nymphs resemble the perfect insect, except that they have merely rudiments of wings. The eggs are carried below the abdomen of the female for seven or eight days till she finally attaches them to some solid body by means of a gummy fluid.

The species are numerous. The *Stylopyga orientālis*, or common kitchen cockroach (in England commonly called *black beetle*), was originally brought from Asia to Europe, and thence to America, where it is now common. The *Stylopyga americāna*, or American cockroach, grows to be 2 or 3 inches long, including the antennæ. Throughout the southern portion of North America and in the West India Islands this species is very troublesome.

COCKS'COMB. A name given to flowering plants of various genera. By gardeners it is properly confined to *Celosia cristāta*; but it is popularly applied to *Pedicularis* or lousewort, *Rhinanthus crista-galli* or yellow-rattle, as also to *Erythræa crista-galli*.

COCK'S-FOOT, or COCK'S-FOOT GRASS. A perennial pasture-grass (*Dactylis glomerāta*) of a coarse, harsh, wiry texture, but capable of growing on barren, sandy places, and yielding a valuable food for sheep very early in the spring. It is a native of Britain and Europe generally, also of Asia and America. The name has been given to it because of the resemblance of its three-branched panicle to the foot of a fowl. It grows with such rapidity that it is said to "grow under the scythe."

COCKSPUR-THORN. The *Crataegus crus-galli*, a North American shrub which has long been cultivated in Britain as a shrubbery ornament. There are several varieties, which are admired for their snowy blossoms in May.

COCKTAIL. Popular apéritif. Most varieties contain spirits, bitters, and flavouring matter. The cocktail originated in the United States, and now nearly every large hotel has a cocktail bar, while cocktail parties have become a form of entertaining.

CO'COA. A name given to the ground kernels of the cacao or chocolate tree prepared to be made into a beverage. *See* CACAO.

COCO DE MER, or "double cocoanut," *Lodoicea Seychellarum*. A palm of the Seychelles bearing a fruit with a double kernel.

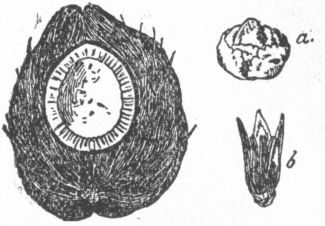
CO'CO-NUT. A woody fruit of an oval shape, from 3 or 4 to 6 or 8 inches in length, covered with a fibrous husk, and lined internally with a white, firm, and fleshy kernel (the endosperm). The tree (*Cocos nucifĕra*) which produces the cocoanut is a palm, from 60 to 100 feet high. Each palm may yield from 100 to 300 nuts a year, and continue to do so for seventy to eighty years. The trunk is straight and bare, and surmounted by a crown of feather-like leaves.

The nuts hang from the summit of the tree in clusters of a dozen or more together. The external rind of the nuts has a smooth surface. This encloses an extremely fibrous substance, of considerable thickness, which immediately surrounds the nut. The latter has a thick and hard shell, with three black scars at one end, through one of which the embryo of the future tree pushes its way. This scar may be pierced with a pin; the others are as hard as the rest of the shell. The young nut encloses a sweet whitish liquid called the *milk*, which hardens and adheres to the shell, forming the kernel. The fruit can float for a long time in sea-water uninjured, and the milk provides a

store of water for the germinating seedling.

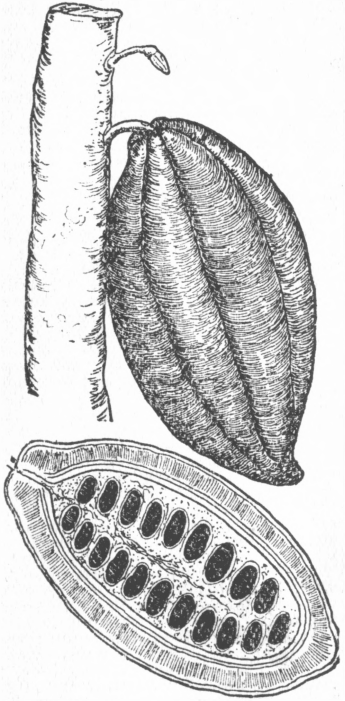
This palm is a native of Africa, the East and West Indies, and South America, and is now grown almost everywhere in tropical countries. Food, clothing, and the means of shelter and protection are all afforded by the coco-nut tree. The kernels are prepared in various ways and used as food, and yield on pressure an oil which is largely imported into various countries. (*See* COCO-NUT OIL.) When dried before the oil is expressed, they are known as *copra*.

The fibrous coat of the nut is made into the well-known coco-nut matting. The coarse yarn obtained from it is called *coir*, which is also used for cordage; it resists the action of salt water. The hard shell of the nut is polished and made into a cup or other domestic utensil. The fronds are wrought into baskets, brooms, mats, sacks, and many other useful articles; the trunks are made into boats or furnish timber for the construction of houses. By boring the inflorescence-



Coco-nut (*Cocos nucifera*)
Inflorescence and (*a*) pistillate, (*b*) staminate flowers

stalk a white sweetish liquor called *toddy* exudes from the wound, and yields by distillation one of the varieties of the spirit called *arrack*. A kind of sugar called *jaggery* is also obtained from the juice by inspissation. One of the most interesting of the modern developments of the coconut is the formation of vegetable butter from the oil.



Cocoa Pods
Showing how the rows of beans are arranged in the cocoa pods. Showing how the rows of beans are arranged in the large pods

COCO-NUT BEETLE (*Batocera rubus*). A large beetle of the family Longicornes, the larvæ of which inhabit coco-nut trees and eat into the stems.

COCO-NUT OIL. A solid vegetable fat, largely used in candle-making and in the manufacture of margarine, soaps, and pomatum. This fat is got by pressure from the albumen of the coco-nut kernel, and is as white as lard, and somewhat firmer. Manila and Ceylon send large quantities of the oil to Britain.

COCOON (French, *cocon*, a small shell). Case which some larvæ of the lepidoptera make and use as a shelter in which to pass their pupal stage. The cocoon of the silk moth yields silk.

COCO-PLUM. The fruit of *Chrysobalanus Icaco*, family Rosaceæ, which is eaten in the West Indies. It is about the size of a plum, with a pleasant though somewhat bitter taste.

COCO ROOT. The name for the corms of several plants of the genus Colocasia (nat. ord. Araceæ), used as food in tropical lands.

COCOS ISLANDS. *See* KEELING ISLANDS.

COCUM-BUTTER, or COCUM-OIL. A pale, greenish-yellow solid oil got from the seeds of *Garcinia purpurea*, a tree of the same genus as mango-

steen, used in India to adulterate ghee or fluid butter. It is sometimes mixed with bear's-grease in pomatums.

COCY'TUS (from Gr. *kōkuein*, to lament). A river of ancient Epirus. Also, among the ancient Greeks, one of the rivers of the lower world.

COD (Gadus). A genus of well-known soft-finned fishes, of the same family as the haddock, whiting, ling, etc., distinguished by the following characteristics : an oblong or spindle-shaped body, covered with small soft scales ; ventrals attached beneath the throat ; gills large, seven-rayed, and opening laterally ; a small beard at the tip of the lower jaw ; generally two or three dorsal fins, one or two anal, and one distinct caudal fin.

The most interesting species is the *common* or *Bank cod* (*G. morrhua*). Though they are found plentifully on the coasts of other northern regions, as Britain, Scandinavia, and Iceland, a stretch of sea near the coast of Newfoundland is by far the best place for catching cod, and the *Grand Banks* there attract large fleets of fishing-boats. Both in its fresh state and when salted and dried it is a substantial and wholesome article of diet; the tongue is considered a delicacy, and the swimming-bladders or *sounds*, besides being highly nutritious, supply, if rightly prepared, an isinglass equal to the best Russian. The oil extracted by heat and pressure from the liver is of great medicinal value, and contributes considerably to the high economic value of the cod.

The cod is enormously prolific, the ovaries of each female containing more than 9,000,000 of eggs ; but the numbers are kept down by a host of enemies. The spawning season, on the banks of Newfoundland, begins about the month of March and terminates in June ; but the regular period of fishing does not commence before April on account of the storms, ice, and fogs. The season lasts till the end of June, when the cod commence their migrations.

The average length of the common cod is about 2½ or 3 feet, and the weight between 30 and 50 lb., though sometimes cod are caught weighing three times this. The colour is a yellowish-grey on the back, with yellowish or brownish spots ; the belly white or reddish, with golden spots in young fish. It is caught by lines and hooks and by trawling.

CO'DA. In music, an adjunct to the close of a composition, for the purpose of enforcing the final character of the movement. Beethoven raised the coda to a feature of the highest importance.

CODE. In jurisprudence, is a name given to a systematic collection or digest of laws. The following are the chief codes which have affected the laws of Europe : The Theodosian Code (*Codex Theodosianus*), a compilation executed in 429 by a commission on behalf of Theodosius the Younger, and promulgated as law throughout the eastern and western empires. The Justinian Code (*Codex Justinianus*), a code compiled in 528, in the reign of the Emperor Justinian, incorporating all the codes, rescripts, and edicts previously in use. *See* CIVIL LAW.

CODEINE (kō-dē'in Gr. *kōdeia*, a poppy-head). A crystallizable alkaloid obtained from opium, in which it exists to the amount of 6 or 8 oz. per 100 lb. It is used to produce sleep and to soothe irritable coughs ; and is a useful remedy in diabetes ; dose, ¼ grain and upwards. It is a poison in excessive doses.

CODE NAPOLÉON (under which name four other codes of commercial law, criminal law, penal law, and law of procedure, drawn up at the same time, are often included). The first code of the French civil law, promulgated on 31st March, 1804, and receiving the official name of *Code Napoléon* on 3rd Sept., 1807. Since 4th Sept., 1870, the laws have quoted it as the *Code Civil*. It is a code in the strictest sense, that is, not merely a collection of laws, but a complete and exclusive statement of the law, virtually amounting to a recasting of the laws of the country.

Under the first empire the adoption of the *Code Napoléon* was made obligatory on all the countries subject to the French, and although it has been judged defective in some technical respects, its brevity, clearness, and modern spirit have made it popular in all the countries where it has been introduced. At present it is recognized in Belgium (with some modifications), and numerous recent codes have taken it as a model, such as the Dutch, Italian, and Spanish codes.

CO'DEX. An ancient written book ; an important ancient MS., as one of the Scriptures or of some classical writer. A collection of laws was also called *codex*, as Codex Theodosianus, Codex Justinianus. *See* CODE.

Codex Alexandrinus.—A manuscript in the British Museum, of great importance in Biblical criticism, written on parchment with uncial letters, and belonging probably to the latter half of the sixth century. It contains the whole Greek Bible (the Old Testament being according to the *Septuagint*), together with the letters of

Bishop Clement of Rome, but it wants parts of Matthew, John, and Second Corinthians. The Patriarch of Constantinople, who in 1628 sent this manuscript as a present to Charles I., said he had received it from Egypt (whence its name).

Codex Sinaiticus.—A very ancient and valuable manuscript of the Greek *Septuagint* version of the Old Testament (including the *Apocrypha*), the whole of the New Testament, the *Epistle of Barnabas*, and a part of the *Shepherd of Hermas*, discovered in the monastery of St. Catherine, on Mount Sinai, by Tischendorf, in 1844. Tischendorf brought forty-three leaves of it back with him; he kept the place of discovery secret, and in 1859 persuaded the monks to present the rest of the MS. to the Czar. It is now at Leningrad.

It is written on parchment in four columns, in early uncial characters, and bears every mark of being of great antiquity, perhaps even older than the Vatican MS. It is assigned by Tischendorf to the fourth century. The Old Testament is defective, but the New Testament is complete, not a word being wanting, which is the more remarkable inasmuch as it is the only manuscript of the New Testament which is complete, being from this and its early date of the highest value. It has been published in facsimile.

Codex Vaticanus.—An ancient Greek MS. of the Old and New Testaments, so called from being contained in the Vatican library at Rome. It is written on thin vellum, in small uncial characters. The manuscript is assigned to the fourth century, and until the discovery of the Sinaitic was regarded as the best manuscript of the Old and New Testaments. The greater part of Genesis in the Old Testament, and the whole of the pastoral epistles and the Revelation in the New Testament, are wanting. A facsimile of it was published in 1868.

CODIÆUM. A genus of shrubs, nat. ord. Euphorbiaceæ, natives chiefly of Indomalaya. *C. variegatum* is grown in hot-houses for its ornamental leaves, which are deep red or curiously mottled, under the name of "Croton."

COD'ICIL. In law, a supplement to a will, to be considered as a part of it, either for the purpose of explaining or altering, or of adding to or subtracting from the testator's former disposition. A codicil may not only be written on the same paper or affixed to or folded up with the will, but may be written on a different paper and deposited in a different place. In general the law relating to codicils is the same as that relating to wills, and the same proofs of genuineness must be furnished by signature and attestation by witnesses. A man may make as many codicils as he pleases, and, if not contradictory, all are equally valid.

COD-LIVER OIL. An oil extracted from the livers of different kinds of cod—the *Gadus morrhua* (common cod) being specified in the pharmacopœia—and allied species. The finest and palest oil is got from fresh and carefully cleaned liver, the oil being extracted either in the cold or by a gentle heat. The darker kinds are got at a higher temperature, and often from the livers in a putrefying state. Only the pale oils are used in medicine; the dark oils are too rank and acrid, and they are only used in dressing leather.

Cod-liver oil is a somewhat complex substance, but the main ingredients appear to be olein and margarin. Acetic, butyric, and other acids are also present, and to these the oil may owe some of its odour. This oil is now a recognized agent in the treatment of rheumatism, gout, scrofula, and especially of consumption, being taken internally and containing a quantity of easily assimilated nutritive matter.

CODOGNO (ko-dō'nyō). A town in North Italy, province of Milan, in a fertile district between the Po and Adda, with a large trade in Parmesan cheese. Pop. 11,208.

COD'RINGTON, Sir Edward. English admiral, born in Gloucestershire 1770. He entered the navy in 1783, obtained a gold medal for his services at the battle of Trafalgar, and was afterwards actively employed both in the Peninsular and second American Wars. In 1827 he commanded the united squadron that overthrew the Turkish fleet in the battle of Navarino. From 1832 to 1837 he was member of Parliament for Devonport. He died in London in 1851.

COD'RUS. According to Greek legend the last King of Athens. Having learned that the enemies of his country would be victorious, according to the declaration of an oracle, if they did not kill the Athenian king, he voluntarily entered their camp, provoked a quarrel, and was slain. The grateful Athenians abolished the royal dignity, substituting that of archon, esteeming no one worthy to be the successor of Codrus. His son Medon was the first archon, chosen for life.

CODY, William Frederick. American showman. Born in Iowa, 26th

Feb., 1845. He served as a scout with the Federal armies during the civil war, and against the Indians. In 1883 Cody started a travelling show, which was very popular in Great Britain and other parts of Europe. He died at Denver, 10th Jan., 1917. Cody won the name of Buffalo Bill by killing buffaloes when engaged to supply meat.

COEFFIC'IENT. In algebra, a number or letter which multiplies others. Thus in the expression $3ax\,y$, 3 is the coefficient of $ax\,y$; $3a$ the coefficient of $x\,y$; $3ax^2$ the coefficient of y.—*Coefficients*, in mechanics, are ratios which measure some particular quality peculiar to a body and which are different for different bodies.—*Coefficient of elasticity* measures the ratio of the stress to the strain produced by it in a body. —*Coefficient of friction* measures the ratio of the frictional force between two bodies to the normal reaction.—*Coefficient of restitution* measures the ratio of the relative velocities after and before impact of two impinging bodies.

COEHORN (köhorn), **Menno, Baron van.** A Dutch military engineer, born 1641, died 1704. Having entered the Dutch military service, he distinguished himself by his invention of small mortars, called after him *coehorns*, but more by his eminence as a master of the art of fortification. He fortified almost all the strong places in Holland.

CŒLENTERA'TA (Gr. *koilos*, hollow, *enteron*, an intestine). A subkingdom of animals, in which the body is essentially composed of two cellular layers—an outer layer or "ectoderm" and an inner layer or "endoderm." No circulatory organs exist, and in most there are no traces of a nervous system. Peculiar stinging organs or "thread-cells" are usually, if not always, present, and in most cases there is a radiate or star-like arrangement of the organs, which is especially perceptible in the tentacles, which are in most instances placed round the mouth. Distinct reproductive organs exist in all, but multiplication also takes place by fission and budding. The Cœlenterata are divided into two great sections, the Actinozoa and Hydrozoa, and include the medusas, corals, and sea-anemones. They are nearly all marine animals.

CŒLE-SYRIA (that is, "Hollow-Syria"). The large valley lying between the Lebanon and Anti-Lebanon mountain ranges in Syria. Near its centre are the ruins of Baalbek.

CŒNOCYTE. A protoplast containing several nuclei and not divided into cells. In the Siphonales among Green Algæ, the whole thallus consists either of a single cœnocyte or of a number of such structures; the Lower Fungi (Phycomycetes) are also cœnocytic. Among higher plants, cœnocytic elements are of isolated occurrence, a good example being furnished by the latex-tubes of Euphorbiaceæ.

CŒNOPTERI'DEÆ. An extinct group of ferns, including the oldest and most primitive leptosporangiate families, such as the Botryopterideæ and Zygopterideæ. Also called Primofilices.

COERCION ACTS. Acts passed by the British Parliament for the purpose of enforcing law and order in Ireland. Since the Union in 1800 the British Parliament was obliged to pass several Coercion Acts, especially towards the middle of last century, when the Fenian Society aroused English feeling by various outrages. In 1880 and 1881, when the agrarian movement in Ireland developed into something like a system of organized terrorism, culminating in the Phœnix Park murders, Gladstone's Government, in order to put a stop to the state of lawlessness prevailing in the country, was compelled to pass the Coercion Act of 1881, and the Crimes Act of 1882. By the first the Lord-Lieutenant of Ireland was empowered to arrest any person on mere suspicion, for treason and intimidation. A Coercion Bill, introduced by Mr. Balfour in 1887, was put in force in 1918, when the need again arose for the repression of crime in Ireland.

COETHEN, or **KÖTHEN** (*keu'*ten). A town of Germany, for some time capital of the former duchy of Anhalt-Coethen, now forming part of the Republic of Anhalt, 80 miles S.W. of Berlin. Beet-root sugar is a staple article of manufacture and commerce. Pop. 26,595.

COFFEE. The seed of an evergreen shrub which is cultivated in hot climates, and is a native of Abyssinia and of Arabia. This shrub (*Coffea arabica*) is from 15 to 20 feet in height, and belongs to the Rubiaceæ. It is most successfully raised on the hills, and often grows at from 1000 to 5500 feet above the sea-level, but it is also found in lower altitudes. The leaves are green, and glossy on the upper surface. The flowers are white and sweet-scented. The fruit is of an oval shape, about the size of a cherry, and of a dark-red colour when ripe. Each of these contains

two cells, and each cell a single seed, which is the coffee as we see it before it undergoes the process of roasting.

Culture.—Great attention is paid to the culture of coffee in Arabia. The trees are raised from seed sown in nurseries, and afterwards planted out in moist and shady situations, on sloping grounds or at the foot of mountains. Care is taken to conduct little rills of water to their roots, which at certain seasons require to be constantly surrounded with moisture.

When the fruit has attained its maturity, cloths are placed under the trees, and upon these the labourers shake it down. They afterwards spread the berries on mats, and expose them to the sun to dry. The husk is then broken off by large and heavy rollers of wood or iron. When the coffee has been thus cleared of its husk it is again dried in the sun, and, lastly, winnowed with a large fan, for the purpose of clearing it from the pieces of husks with which it is intermingled. A pound of coffee is generally more than the produce of one tree; but a tree in great vigour will produce 3 or 4 lb.

Varieties.—The best coffee has its name from Mocha, on the Red Sea. It is packed in large bales, each containing a number of smaller bales, and when good appears fresh and of a greenish-olive colour. Next in quality to the Mocha coffee may perhaps be ranked that of Southern India and that of Ceylon, which is strong and well-flavoured; but comparatively little coffee now comes from Ceylon. Java and Central America produce large quantities of excellent coffee. Brazilian coffee, though produced more abundantly than any other, stands at the bottom of the list as regards quality. Liberian coffee may also be mentioned.

Of the best Mocha coffee grown in the province of Yemen little or none is said to reach the Western markets. Arabia itself, Syria, and Egypt consume fully two-thirds, and the remainder is exclusively absorbed by Turkish or Armenian buyers. The only other coffee which holds a first rank in Eastern opinion is that of Abyssinia. Then comes the produce of India, which those accustomed to the Yemenite variety are said to consider hardly drinkable. American coffee holds in the judgment of all Orientals the very last rank.

History of Cultivation.—The Dutch were the first to extend the cultivation of coffee beyond the countries to which it is native. About 1690 some coffee-seeds were brought to Java, where they were planted and produced fruit. A plant was shortly taken to Amsterdam, and in 1712 the Dutch presented a seedling to Louis XIV. In 1720 seedlings were sent to Martinique, Surinam, and ultimately distributed throughout the tropics of the New World. About the same time a Mohammedan pilgrim, Baba Budan, had conveyed live seeds direct from Mecca to Mysore (India). It was not till 1774 that the planters of Brazil, now the greatest producers of coffee in the world, commenced its cultivation.

Coffee as an article of diet is of but comparatively recent introduction. To the Greeks and Romans it was wholly unknown. From Arabia it passed to Egypt and Turkey, whence it was introduced into England by a merchant named Edwards in 1652. He was accustomed to trading with Turkey, and his Greek servant, named Pasqua, first opened a coffee-house in London. Some commentators, however, think that coffee is alluded to in *The Tempest*, i. 2, 334. In 1671 an Armenian named Pascal set up a coffee-house in Paris. In Great Britain much less is drunk than on the continent of Europe or in the United States and Canada, tea being the British national beverage.

Preparation.—The excellence of coffee depends in a great measure on the skill and attention exercised in roasting it. If it be too little roasted it is devoid of flavour, and if too much it becomes acrid, and has a disagreeable burnt taste. Coffee is used in the form either of an infusion or a decoction, of which the former is decidedly preferable, both as regards flavour and strength. The fine aromatic oil which produces the flavour and strength of coffee is lost by boiling. The best mode is to pour boiling water through the coffee in a biggin or strainer, which is found to extract nearly all the strength; or to pour boiling water upon it and set it upon the fire for not more than ten minutes. Prepared in either way it is fine and strong.

In the Asiatic mode of preparing coffee the beans are pounded, not ground; and though the Turks and Arabs boil the coffee, they boil each cup by itself and only for a moment, so that the effect is much the same as that of infusion. In Arabia some additional spicing generally of saffron or some aromatic seeds, is considered indispensable; but neither Turks nor Arabians use sugar or cream with coffee.

Consumption.—The world's supply of coffee has been estimated at from 15 to 16 million bags (of 132 lb. weight). The greatest coffee-consuming countries are Holland, Belgium, the United States of America,

Germany, France, Austria, Hungary, and the United Kingdom. In Britain, however, the public taste in coffee is far from critical, comparatively worthless mixtures of coffee with chicory, in which the baser ingredient is not spared, being readily accepted in place of the pure article.

The refreshing action of coffee depends on the presence of about 1½ per cent. of *caffeine*, one of the purin bases, nitrogenous compounds allied to the alkaloids; this same substance, which is also present in tea (2 to 5 per cent.) and to a less extent in cocoa (·5 per cent.), is a powerful brain-stimulant, and also a diuretic. As in the case of tea, the pleasant aroma is due to a volatile oil, which is largely developed by the roasting process. Another species, *C. liberica*, yields an inferior sort of coffee, but can be grown in climates which are too hot for the Arabian plant.

Coffee is an important article of commerce, the export trade from Brazil alone being worth over £50,000,000 in 1920. — BIBLIOGRAPHY: B. B. Keable, *Coffee, from Grower to Consumer*; Walsh, *Coffee: its History*; J. Jotapen, *The Cultivation and Preparation of Coffee for the Market*.

COFFEE-BUG (*Lecanium coffeæ*). An insect of the Coccus family, very destructive in coffee plantations.

COFFER. In architecture, a sunk panel or compartment in a ceiling of an ornamental character, and usually enriched with mouldings, and having a rose, pomegranate, etc., in the centre.

COFFER-DAM. A temporary enclosure, or dam, formed in the water in order to permit of the construction of foundations to bridge-piers, quay-walls, etc. It usually consists of two rows of wood, or steel sheet piling, driven 2 to 4 feet apart, the interval being filled in with clay puddle, the whole then forming a watertight wall or dam, surrounding the site of the proposed foundations. This enclosed area is then pumped out. The wooden piling normally consists of 2-inch by 6-inch timbers, with 12-inch by 12-inch piles every 5 to 6 feet, with horizontal "walings" at intervals, and diagonal braces and struts. The puddle wall should not exceed 3 to 4 feet in thickness, being kept as thin as is compatible with the quality of clay available.

COFFIN. The chest or box in which a dead body is enclosed for burial. Coffins were invented by the Egyptians during the fourth millennium B.C., but among other people in antiquity they were used mostly to receive the bodies of persons of distinction. Among the Romans it was afterwards the almost universal custom to consume the bodies with fire, and deposit the ashes in urns. In Egypt coffins seem to have been used in ancient times universally. They were of stone, earthenware, glass, or wood. A sort of ancient coffin is known as a *sarcophagus* (Gr. *sarx*, flesh, and *phagein*, to eat, consume), an expression of the early belief that stone consumed the flesh of the corpse. Coffins among Christians were introduced with the custom of burying.

Modern coffins are usually made of wood, in England generally of elm or oak, and are sometimes enclosed in a leaden case. It has been often proposed that they should be made with a hole opposite the place of the mouth of the body, so as to allow breathing in case of revival. Of course it would be necessary, at the same time, to let the coffin stand for some days in a convenient place, as is the custom in some parts of Germany. Coffins for what is called "Earth to Earth Burial" are made of wicker-work, covered with a thin layer of papier mâché over cloth. Coffins used in cremation are made of some light material easily consumed and yielding little ash.

COGNAC (kon-yák), a town in France, department of Charente, and near the River Charente, 22 miles W. of Angoulême, pleasantly situated on a hill, crowned by the remains of an old castle. It is famous for the brandy which bears its name, and which is exported to all parts of the world. Pop. 17,404.

COGNATES. In Scots law, relations by the mother's side. *See* AGNATES.

COG'NISANCE. In heraldry, a crest, coat of arms, or similar badge of distinction appertaining to a person or family; in law, judicial or formal notice or acknowledgment of a fact having legal consequences.

COGNO'MEN. The hereditary family name (such as Cicero, Cato, etc.) among the ancient Romans. The other two names generally borne by every well-born Roman, viz. the *prænomen* and *nomen* (as in Marcus Tullius Cicero), served to denote the individual (Marcus), and the *gens* (Tullius) or clan to which his family belonged.

COGNO'VIT. In law, is a written confession given by the defendant that the action of the plaintiff is just, or that he has no available defence.

COHEN, Hermann. German philosopher of Jewish extraction, born

4th July, 1842, at Koswig, died 1918. Educated at the Jewish theological seminary at Breslau, and at the Universities of Berlin and Halle, he became professor of philosophy at Marburg in 1875, and was one of the foremost leaders of the neo-Kantian movement. Whilst agreeing with Kant's theory of knowledge, he continued the latter's philosophy independently in the direction of idealism. He excluded the *thing-in-itself* from Kant's system, made it better known to students, and brought philosophy into closer connection with the sciences.

COHE'SION. The force by which the various particles of the same material are kept in contact, forming one continuous mass. Its action is seen in a solid mass of matter, the parts of which cohere with a certain force which resists any mechanical action that would tend to separate them. In different bodies it is exerted with different degrees of strength, and it is measured by the force necessary to pull them asunder. Cohesion acts at insensible distances, or between particles in contact, and is thus distinguished from the attraction of gravitation. It unites particles into a single mass, and that without producing any change of properties, and is thus distinguished from *adhesion*, which takes place between different masses or substances; and from *chemical attraction* or *affinity*, which unites particles of a different kind together and produces a new substance. Hardness, softness, tenacity, elasticity, malleability, and ductility are to be considered as modifications of cohesion. The great antagonist of cohesion is heat.

Cohesion, in flowers, the union of parts of the same kind, as the petals of gamopetalous flowers.

COHESION FIGURES. A class of figures produced by the attraction of liquids for other liquids or solids with which they are in contact, and divided into *surface*, *submersion*, *breath*, and *electric cohesion figures*. Thus a drop of an independent liquid, as oil or alcohol, will spread itself out on the surface of water always in a definite figure, but differing with each fluid dropped on the water.

Breath figures are produced by putting a drop of the liquid to be examined on a slip of mica, and breathing on it, when each fluid takes a distinct characteristic shape.

Electric cohesion figures are produced by electrifying drops of various liquids placed on a plate of glass. (*See* papers by C. Tomlinson in the *Philosophical Magazine*, from October 1861.)

COHOES (ko-hōz'). A city of Albany County, New York, United States, on the west bank of the Hudson River, at the mouth of the Mohawk, with unlimited water-power derived from the Mohawk falls. There are large cotton and other mills. Pop. 23,226.

COIF. In England, the badge of serjeants-at-law, who were called serjeants of the coif, from the lawn coif or cap which they wore under their caps when created serjeants. The coif was afterwards represented by a piece of black silk edged with white on the top of the wig. The Society of Serjeants-at-law was dissolved in 1877.

COIL. Wire wound spirally or otherwise for creating a magnetic field when electric currents are passed through it, an inserted iron bar being magnetized. **Induction coils,** in which a lower voltage current in a primary coil induces a higher voltage current in an outer secondary coil, are used in telephony and for medical and other purposes. **Choking coils** steady rapid fluctuations in alternating currents. **Resistance coils** offer definite resistance to the passage of current. **Search coils** carried by aircraft assist landing in fog.

COIMBATORE (ko-im-ba-tōr'). A town of India, Madras Presidency, capital of the district to which it gives name, situated on the River Noyil, with wide streets, abundant water, and a healthy climate. Pop. 65,788. The district has an area of 7860 sq. miles. It is fertile, producing sugar, cotton, rice, and tobacco; and well watered by several rivers. Pop. 2,202,312.

COIMBRA (ko-im'brá). A city of Portugal, province of Beira, partly on a hill, partly on low ground, on the River Mondego, 115 miles N.N.E. of Lisbon. It occupies the site of the Roman Æminium, and was the capital of Portugal from 1129 to 1383. It is a bishop's see, and contains an old and a new cathedral, a hospital, and a university, which is the oldest in the country (founded 1290). The city has also a college of arts. Manufactures: linen, pottery, articles of horn. The neighbourhood produces oil, wine, lemons, and oranges of excellent quality. Pop. 20,841.—The district of **Coimbra** has an area of 1508 sq. miles, and a pop. of 353,121.

COIN (ko-in'). A town, Spain, Andalusia, province of Malaga, and 20 miles W. of the town of that name, on a gentle declivity facing the north. In the neighbourhood are quarries of marble. Pop. 12,290.

COINING. The art of converting pieces of metal into current coins for the purposes of commerce, usually performed in a Government establishment called a *mint*. In England the metal, say gold, is brought to the mint in the form of ingots, each weighing about 400 oz. Each ingot is tested by the assayer, and according to his report the melter adds copper to bring it to the *standard fineness* (22 parts pure gold to 2 parts copper). For sovereigns the metal is cast into bars of about 26 lb., measuring 21 inches long, 1·375 inch broad, and 1 inch thick. Each bar is then assayed and forwarded to the coining department, where it is passed between rollers of cast iron till it is reduced in thickness to 0·194 inch thick and increased in breadth to 1·712 inch.

The bars are now annealed, after which they are again rolled, and come out 0·120 inch thick by 1·778 inch wide. The fillets, as the bars are now called, are taken to the cutting-room, where blanks the size of the required coin are struck out by steel cylinders. Before entering the press-room, however, the blanks are annealed to soften them for the die, cleaned by being put for a few minutes into a pot of hot and dilute sulphuric acid, and then stamped. The coins are then sent to be weighed by the automatic balance, and those that are 123·274 grains in weight, or not more than 0·2568 grain above or below it (this extent of deviation being allowed), pass on to be issued.

Before any coin is allowed to leave the mint it is inspected as to its workmanship, and as to being within the limits under or over the standard weight. From each bag of £1000, into which they are placed, a certain number of coins are taken and carefully weighed. From this number of coins two are taken, one of which is handed to the chief assay-master to prove that the metal has undergone no deterioration in any of the processes of manufacture; the other piece is sealed up in a packet and consigned to the *pyx-box*, where it remains until the *trial of the pyx*, which takes place every year.

Coining is one of the prerogatives of the supreme power in all States, and counterfeiting, or otherwise tampering with the coin of the realm, is always severely punished. Thus in Britain it is made a felony to counterfeit coin; to colour or gild so as to make a resemblance to gold or silver in; to impair, lighten, or melt coin; to have in unlawful possession filings or clippings produced by impairing or lightening coin; to buy or sell, or export or utter counterfeit coin, or have in possession coining tools. It is a misdemeanour to deface coin by stamping or bending it for advertising purposes, and a penalty is imposed for uttering such defaced coin.

COIR. *See* COCO-NUT.

COIRE (kwär), or **CHUR** (hör) (ancient **Curia Rhætorum**). The capital of the Swiss canton of the Grisons (Graubünden), on the Rivers Plessur and Rhine. It entered the Confederation in 1498. It is irregularly built, and possesses many picturesque old houses. Not far from Coire the Rhine begins to be navigable for small vessels. Pop. 15,767.

COKE, Sir Edward. An eminent English lawyer, the son of a Norfolkshire gentleman, was born in 1552. After finishing his education at Cambridge he went to London, and entered the Inner Temple. His reputation and practice rapidly increased. He was chosen recorder of the cities of Norwich and of Coventry, knight of the shire for his county, and, in spite of the rivalship of Bacon, Attorney-General. As such he conducted the prosecutions for the Crown in all great State cases, notably those of Essex and Sir Walter Raleigh, at which he displayed great rancour and asperity.

In 1613 he became Chief Justice of the Court of King's Bench; but his rough temper and staunch support of constitutional liberties brought him into disfavour with King James and his courtiers. In 1621 he was committed to the Tower, and soon after expelled from the Privy Council. In 1628 he was chosen member for Buckinghamshire, and greatly distinguished himself by his vindication of the rights of the Commons, and by proposing and framing the famous Petition of Rights.

This was the last of his public acts. On the dissolution of the Parliament he retired to his seat in Buckinghamshire, where he died, Sept., 1634. His principal works are: *Reports, from 1600 to 1615; Institutes of the Laws of England*, in four parts, the first of which contains the celebrated commentary on Littleton's *Tenures* ("*Coke upon Littleton*"); *A Treatise of Bail and Mainprize*; *Complete Copyholder*.—BIBLIOGRAPHY: H. W. Woolrych, *The Life of Sir Edward Coke*; Lord Campbell, *The Lives of the Chief Justices of England*.

COKE. The non-volatile residue of coal after distillation at a comparatively elevated temperature. When wood, peat, etc., have been distilled, the residue is usually called "charcoal"; when coal, lignite, etc., have been destructively distilled out of contact with air, the residue is called "coke." Coke is a porous vesicular carbonaceous mass of irregular cells

joined together by walls impervious to gases.

Coke is chiefly carbon and ash, but contains other elements also. Below is a table showing the chemical composition of a coal and its coke.

	Coal.	Coke.
Carbon . .	80 per cent.	88 per cent.
Oxygen . .	8·8 ,,	Variable up to 3 per cent.
Hydrogen .	5·5 ,,	0·2 per cent.
Nitrogen .	1·5 ,,	2·0 ,,
Sulphur . .	0·8 ,,	1·0 ,,
Ash . . .	3 to 4 per cent.	5 to 8 per cent.

Coke should be hard, if used for blast-furnace work, sonorous, and should contain little breeze; in colour it may range from silver-grey to black, and in lustre from silky to dull. When the coke is hard, it will be easier to handle and give less smalls. The smalls may cause stoppages in the furnace, and are attacked by the carbon dioxide more easily, producing carbon monoxide with absorption of heat.

Properties.—The value of a coke is more dependent upon its pyrometric heating effect than upon its calorific value. Hence for heating and metallurgical work it should be dense, so that as large a number of heat units as possible is obtained in a given space, and it should also be porous to obtain rapid combustion. It should resist the action of carbon dioxide at all places in the furnace not undergoing proper combustion. For non-ferrous blast-furnaces the coke should be more porous than coke for iron blast-furnaces, whilst coke for domestic consumption should be even more porous, and should contain a large amount of volatile matter. Retort-oven coke is less porous than beehive-oven coke.

Coke is hygroscopic, and can reach a moisture content of 4 to 6 per cent. This water causes a waste of heat, and should be kept as low as possible.

It weighs about 22 to 23 lb. per cubic foot, but the "apparent" specific gravity depends on the number of cell walls and the ash.

To improve the structure and strength of the coke, the coal may be finely ground, wetted, compressed, and then carbonized. This procedure increases the coke output by 10 per cent.

Industrial Uses.—Coke is used in the ferrous and non-ferrous smelting-works; it is used as a reducing agent in chemical industry, e.g. in the manufacture of phosphorus (U.S.A. Pat. 1314229, 1919, 8, 26), and it is used as a fuel both in manufacture and in the home. There are other miscellaneous uses, e.g. as a filling material in scrubbers, in Leclanché cells, in carbon arc-lamps, etc.

In industry, when coke is used as the fuel, a high efficiency may be obtained which is rarely approached by coal-fed boilers. Coke and coke breeze or dust is more suitable for marine, Lancashire, and Cornish boilers than for water-tube boilers, and for this purpose the moisture should not exceed 6 per cent., nor the ash exceed 10 per cent. Moisture decreases the calorific value greatly. An increased draft will intensify the temperature up to the point when the large excess of nitrogen in the air will lead to cooling. For smelting work, a hot-air blast increases the pyrometric heating effect, because more air can be blown through without chilling.

Composition.—The composition of a coke varies within wide limits. Its carbon content may be from 80 to 93 per cent. and the higher the carbon the better the coke. The ash may be from 4 to 12 per cent., and a good coal will give a coke with low ash; with specially selected coals the ash content of a coke may fall to 4 per cent. This ash should be difficult to fuse or clinkering troubles will be encountered, and the red colour of an ash is taken as a bad indication of fusibility.

The volatile gases in a coke, consisting of hydrogen, oxygen, and nitrogen, usually amount to about 4 per cent.

The sulphur may be from 0·5 to 2· per cent. A good blast-furnace coke should not contain over 1 per cent sulphur, the best coke containing u to 0·5 per cent. sulphur. In treatin sulphur ores of the metals a sma amount of sulphur is of no great in portance, whilst if the coke is to b used as a fuel, the sulphur, especiall if it is in the coke ash, is not usuall detrimental.

COKE-OVENS and VERTICAL RETORTS. Coal may be carbonized to obtain either the maximum amount of gas, as in the gasworks, or of coke, as in the manufacture of metallurgical coke. For the latter purpose, especially where carbonization in bulk is desired, the coke-oven is most employed. Vertical retorts, as distinguished from the horizontal retorts of the gasworks, may be employed for either purpose.

The simplest form of coke-oven is the beehive oven, which gives a yield of 60 to 65 per cent. of coke, calculated on the coal used.

The charge, which generally is between 5 tons, is put through the top hole into the oven red-hot from previous

working. The gas is fired as it is evolved, and the burning is regulated by air-holes in the upper part of the door-stopping.

The oven may be modified to allow of the recovery of by-products and the utilization of waste heat, but more modern ovens are displacing the beehive, of which there are now very few in operation.

The popularity of the modern coke-oven or vertical retort is due to the economies in plant, labour, and outlay obtainable by large-scale working. Especially in the case of vertical retorts, the claims are made that a greater yield of gas per given ground area is obtained, working conditions are better than in the retort-house of the gasworks, the fuel consumption is low, the heat may be controlled very well, the coal is treated uniformly and gives a uniform gas, the heat in the coke may be utilized, the gas need not be subjected to cracking, the yield of gas per ton of coal is increased, especially by steaming, and no heavy or complicated machinery is necessary. To a large extent these claims have been satisfactorily substantiated.

The retorts and ovens in general use to-day are of many forms, the chief differences, however, being in details. The oven proper is generally a long chamber, about 30 feet long by 6 to 7 feet high, by 17 to 20 inches wide. The retorts are charged at the top, and carbonization lasts about twenty-four to thirty-six hours. The by-products are recovered upon similar lines to those used in gasworks practice.

There are many varieties of patent coke-ovens with and without plant for the recovery of by-products. A system much used in Great Britain is the Otto-Hoffman system.—Cf. H. Sexton and W. B. Davidson, *Fuel and Refractory Material*.

COL (Fr., neck). An elevated mountain pass between two higher summits. The name is used principally in those parts of the Alps where French is commonly spoken, e.g. Col de Balne, Col du Géant.

COLBERG. A seaport and watering-place, Pomerania, Prussia, on the Baltic. It is a fishing centre and has some manufactures. Pop. 30,000.

COLBERT (kol-bār), **Jean Baptiste.** A celebrated French Minister of Finance, born at Rheims in 1619, died in 1683. After serving in various subordinate departments Colbert was made Intendant, and at length Comptroller-General of the Finances. His task was a difficult one. He found disorder and corruption everywhere. The State was the prey of the farmers-general, and at the same time maintained only by their aid. The people were obliged to pay 90,000,000 livres of taxes, of which the king received scarcely 35,000,000; the revenues were anticipated for two years, and the treasury empty.

Colbert at once commenced a system of stringent reforms, abolishing useless offices, retracting burdensome privileges, diminishing salaries, and distributing and collecting the taxes by improved methods till he had reduced them almost to one-half. To his talents, activity, and enlarged views the development and rapid progress of industry and commerce in France were largely due. He constructed the Canal of Languedoc; declared Marseilles and Dunkirk free ports; granted premiums on goods exported and imported; regulated the tolls; established insurance offices; revised the Civil Code, introduced a code of marine law, and the so-called Code Noir for the colonies; laboured to render the pursuit of commerce well esteemed, and invited the nobility to engage in it. The French colonies in Canada, Martinique, etc., showed new signs of life; new colonies were established in Cayenne and Madagascar, and to support these Colbert created a considerable naval force.

Under the protection and in the house of the minister (1663) the Academy of Inscriptions was founded. Three years afterwards he founded the Academy of Sciences, and in 1671 the Academy of Architecture. He enlarged the Royal Library and the Garden of Plants, and built an observatory, in which he employed Huyghens and Cassini. He began the measurement of the meridian in France, and sent men of science to Cayenne. After having conferred the greatest benefits on his country he died in 1683, out of favour with the king, whose confidence in Colbert had been undermined by Louvois, and hated by the people, who were enraged at the exorbitant taxes.—BIBLIOGRAPHY: Mme. Clément, *Histoire de Colbert et de son administration*; Sargent, *Economic Policy of Colbert*; A. Neymarck, *Colbert et son temps*.

COLBURN, Zerah. "The calculating boy," born in Vermont, United States, in 1804, died in 1840. Before his sixth year he began to manifest wonderful powers of arithmetical computation, and in public exhibitions astounded learned mathematicians by the rapidity and accuracy of his processes, but the faculty left him when he grew up. After acting as a teacher and itinerant preacher, he was from 1835 till his death professor of languages at Norwich University, Vermont.

COL'CHESTER. A municipal borough and river-port, England, County Essex, 51 miles N.E. by E. of London, mostly situated on the summit and sides of an eminence rising from the River Colne; well built and amply supplied with water. It has a good coasting trade and employs a great number of small craft in the oyster-fishery. It is a place of high antiquity, there being no place in the kingdom where so great a quantity and variety of Roman remains have been found as here. It is supposed to be the *Camulodunum* of the Romans, and was called *Colne Ceaster*, from its situation on the Colne, by the Anglo-Saxons. A parliamentary borough until 1918, it now gives its name to a parliamentary division of the county. Pop. (1931), 48,607.

COLCHICIN (kol'ki-sin). An alkaloid obtained from colchicum, used for the alleviation or cure of gout and rheumatism. It acts as an emetic, diuretic, and cathartic, in large doses as a narcotico-acrid poison.

COLCHICUM (kol'ki-kum). A genus of plants, nat. ord. Liliaceæ. The *Colchicum autumnale*, or meadow saffron, is a bulbous-rooted, stemless, perennial plant, which grows in various parts of Europe, and is common in pastures in parts of England. From a small corm or bulb buried about 6 inches deep, and covered with a brittle brown skin, there rises in the early autumn a tuft of flowers having much the appearance of crocuses, flesh-coloured, white, or even variegated. They soon wither, and the plant disappears till the succeeding spring, when some broad leaves are thrown up by each corm along with a triangular oblong seed-vessel. The plant is acrid and poisonous, and cattle are injured by eating it, but it yields a medicine valuable in gout and rheumatism. *See* COLCHICIN.

COLCHIS (kol'kis). The ancient name of a region at the eastern extremity of the Black Sea, resting on the Caucasus, famous in Greek mythology as the destination of the Argonauts, and the native country of Medea. The principal coast town was Dioscurias (the Roman Sebastopolis).

COL'COTHAR. An impure brownish-red oxide of iron, which forms a durable colour, but is most used in polishing glass and metals.

COLD. The absence of sensible heat, especially such a want of heat as causes some discomfort or uneasiness. The temperature in which man and other animals live is generally below the natural heat of the body, but this is easily kept up in ordinary cases by means of the food taken in and digested. A high degree of cold, however, produces bodily depression, and is a frequent source of disease, or even of death. For the ailment called *a cold*, *see* CATARRH. Artificial cold may be produced by evaporation of a liquid or by means of a freezing-mixture. *See* FREEZING-MIXTURE; LIQUID AIR.

COLD-BLOODED ANIMALS. A term applied to those animals, such as reptiles, the temperature of whose blood ranges from the freezing-point, or near it, to 90° F., in accordance with that of the surrounding medium. Reptiles, amphibians, and fishes are permanently cold-blooded, whilst a nestling and a hedgehog are temporarily cold-blooded.

COLD CREAM. A cooling ointment prepared in various ways. A good variety may be made by heating four parts of olive oil with one of white wax. This ointment cools the skin, rendering it soft and pliable, and is successfully applied for the cure of chapped hands.

COLD STORAGE. Method of preserving perishable food. It consists in maintaining the atmosphere at a suitable temperature, often at or below zero. Refrigeration has played an important part in the foreign meat trade, enabling frozen carcases to be sent to great distances. Ice safes are also much used by retail butchers, and the invention of an electrical method is extending refrigeration to domestic use.

COLDSTREAM. A burgh of Scotland, in Berwickshire, on the Tweed. In its vicinity is the famous ford of the Tweed. When General Monk quartered here in 1659-60 he raised an infantry regiment, which is called the *Coldstream Guards*, and, with the exception of the 1st Foot, is the oldest in the British army. As a border town Coldstream, like Gretna Green, was formerly famous for its clandestine marriages. Pop. (1931), 1233.

COLDSTREAM GUARDS. *See* GUARDS, BRIGADE OF.

COLD WAVE. The term usually given to a period of intense and sudden cold which, in the United States, frequently follows the passage of a cyclone. The cyclone generally travelling from west to east, the succeeding wave of warm wind from the Pacific dies to a calm, and its place is taken by air from the Arctic regions, which, passing the Rocky Mountains, sweeps over the country in a dense "wave," not seldom causing a fall of 50° in the temperature within a period of twenty-four hours, and at times resulting in some loss of life.

COLE, Thomas. A landscape painter. He was born in England in 1801, but was taken quite young to America, where he died in 1848. Among his works are: *The Voyage of Life*, *The Course of Empire*, *The Hunter's Return*, and *Views in the White Mountains*.

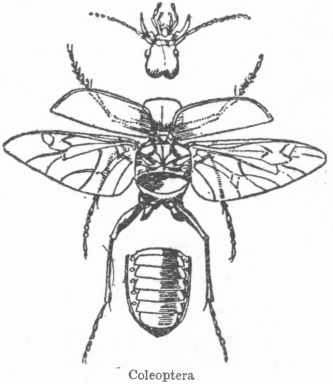
COLEBROOKE, Henry Thomas. Oriental scholar, born in London in 1765, died there 1837. He became professor of Sanskrit at Calcutta and director of the Bengal Asiatic Society. His translations from the Sanskrit and his essays on Hindu subjects were valuable contributions to Oriental scholarship.

COLEMANITE. A mineral hydrous calcium borate, occurring in fine white or colourless monoclinic crystals in the salt-lake deposits of the western United States.

COLEN'SO, John William, D.D. Bishop of Natal, born in 1814, died in 1883. He was educated at Cambridge, was assistant master at Harrow till 1842, and in 1853 was appointed first Anglican Bishop of Natal, South Africa. He published treatises on algebra and arithmetic which were long popular textbooks in schools and colleges. His work on the *Pentateuch* and *Book of Joshua*, which called in question the historical accuracy of these books, involved the author in a conflict with his ecclesiastical superiors, and he was deposed by the Bishop of Cape Town. But the decisions of the Privy Council and Court of Chancery were in his favour, and he continued to officiate as bishop. His other works include: *Ten Weeks in Natal* and a *Zulu Grammar*.—Cf. Sir G. W. Cox, *Life of Bishop Colenso*.

COLEOCHÆTE. A genus of Green Algæ, family Ulotrichales. The thallus, which grows attached to the submerged parts of larger water-plants, is usually disc-shaped and bears curious sheathed hairs. The sexual process is oögamous. The oöspore divides into a group of resting cells (up to 16) enveloped in a protective layer, each of which subsequently liberates a swarm-spore. This multicellular "fruit" was formerly regarded as a primitive type of sporophyte generation, but recent work has shown that this view is incorrect. *See* GENERATIONS, ALTERNATION OF; REDUCTION DIVISION; SPOROPHYTE.

COLEOP'TERA (Gr. *koleos*, a sheath, and *pteron*, a wing). An order of insects, commonly known as *beetles*. They have four wings, of which the two front ones (*elytra*) are not suited to flight, but form a covering and protection to the two hind ones, and are of a hard and horny or parchment-like nature. The hind-wings, when not in use, are folded transversely under the fore-wings. The coleoptera undergo a perfect metamorphosis. The larva generally resembles a short



Coleoptera

thick worm with six legs and a scaly head and mouth.

COLERAINE (kōl-rān'). A town, Londonderry, Northern Ireland, on both sides of the River Bann, 47 miles N.W. of Belfast. Its trade, chiefly in linen, agricultural produce, and provisions, is considerable. Until 1885 it returned one member to the House of Commons. Pop. (1926), 8080.

COLERIDGE (kōl'rij), **Hartley.** Eldest son of Samuel Taylor Coleridge, was born at Clevedon, near Bristol, on 19th Sept., 1796, died 6th Jan., 1849. In 1815 he went to Oxford, where, three years after, he took his degree. Unfortunately he had contracted a propensity for drinking, and was deprived, on account of his intemperate habits, of a fellowship he had obtained from Oriel College.

He then left Oxford and took up his residence at London, but afterwards he resided in the Lake country, where he occupied himself with literary composition. In verse, his sonnets, and in prose, his biographies *Worthies of Yorkshire and Lancashire* and *Life of Massinger*, are the most important of his works. His life was written by his brother Derwent.

COLERIDGE, Henry Nelson. The son of Colonel Coleridge, and nephew and son-in-law of Samuel Taylor Coleridge, born in 1798, died 26th Jan., 1843. A distinguished student at Cambridge, and a contributor along with Macaulay and Praed to *Knight's*

Quarterly Magazine, he is best known as the editor of the *Literary Remains* and *Table Talk* of his uncle. His wife, Sara Coleridge, a daughter of the great poet, aided her husband materially in his editorial work and continued it after his death. She died 3rd May, 1852.

COLERIDGE, Samuel Taylor. A celebrated English poet and philosopher, was born on 21st Oct., 1772, at Ottery St. Mary, Devonshire, of which his father was vicar. Sent to school at Christ's Hospital, to which he had obtained a presentation, young Coleridge took little interest in the ordinary sports of childhood, and was noted for a dreamy abstracted manner, though he made considerable progress

Samuel Taylor Coleridge

in classical studies, and was known even at that early age as a devourer of metaphysical and theological works.

From Christ's Hospital he went with a scholarship to Jesus College, Cambridge, where he remained for two years, but without achieving much distinction, except by winning the Browne medal for a Greek ode in 1792. At this time, too, his ultra-radical and rationalistic opinions made the idea of academic preferment hopeless, and perhaps it was partly to escape the difficulties and perplexities gathering about his future that Coleridge suddenly quitted Cambridge and enlisted in the 15th Dragoons.

Rescued by his friends from this position, he took up his residence at Bristol with two congenial spirits, Robert Southey, who had just been obliged to quit Oxford for his Unitarian opinions, and Lovell, a young Quaker. The three conceived the project of emigrating to America, and establishing a "pantisocracy" as they termed it, or community in which all should be equal, on the banks of the Susquehanna. This scheme, however, never became anything more than a theory, and was finally disposed of when, in 1795, the three friends married three sisters, the Misses Fricker of Bristol.

Coleridge about this time started a periodical, *The Watchman*, which did not live beyond the ninth number. In 1796 he took a cottage at Nether Stowey, in Somersetshire, where, soothed and supported by the companionship of Wordsworth, who came to reside in Alfoxden, he wrote much of his best poetry, in particular *The Ancient Mariner* and the first part of *Christabel*. While residing at Nether Stowey he used to officiate in a Unitarian chapel at Taunton, and in 1798 received an invitation to take the charge of a congregation of this denomination at Shrewsbury, where, however, he did nothing further than preach the probation sermon.

An annuity bestowed on him by some friends (the Wedgwoods) furnished him with the means of making a tour to Germany, where he studied at the University of Göttingen. In 1800 he returned to England and took up his residence beside Southey at Keswick, while Wordsworth lived at Grasmere in the same neighbourhood. From this fact, and a certain common vein in their poetry, arose the epithet of "Lake School" applied to their works.

About 1804 Coleridge went to Malta to re-establish his health, seriously impaired by opium-eating. In 1806 he returned to England, and after ten years of somewhat desultory literary work as lecturer and contributor to periodicals, Coleridge took refuge from the world in the house of his friend Gillman at Highgate, London. Here he passed the rest of his days, holding weekly conversaziones in which he poured himself forth in eloquent monologues, being by general consent one of the most wonderful talkers of the time.

His views on religious and political subjects had now become mainly orthodox and conservative, and a great work on the Logos, which should reconcile reason and faith, was one of the dreams of his later years. But Coleridge had long been incapable of concentrating his energies on anything, and of the many years he spent in the leisure and quietness

of Highgate nothing remains but the *Table Talk* and the fragmentary notes and criticism gathered together and edited by his nephew, valuable enough of their kind, but less than might have been expected of Coleridge. He died 25th July, 1834.

The dreamy and transcendental character of Coleridge's poetry eminently exhibits the man. In his best moments he has a fine sublimity of thought and expression not surpassed by Milton; but he is often turgid and verbose. But Coleridge was not only a poet; he was also a critic, a philosopher, and a political writer. He did not claim to be the author of a new and original system of philosophy, his system, as he wrote himself, being "an attempt to reduce all knowledge to harmony—to unite the separated fragments of the mirror truth." As a political writer Coleridge belonged to the school of Burke. As a critic, especially of Shakespeare, Coleridge's work is of the highest rank, combining a comprehensive grasp of large critical principles and a singularly subtle insight into details.

Coleridge's poetical works include: *The Ancient Mariner*; *Christabel* (incomplete); *Remorse*, a tragedy; *Kubla Khan*; and a translation of Schiller's *Wallenstein*; his prose works, *Biographia Literaria*, *The Friend*, *The Statesman's Manual*, *Aids to Reflection*, and *On the Constitution of Church and State*. Posthumously were published specimens of his *Table Talk*, *Literary Remains*, and *Theological Notes*. The best edition of his works was issued in 1907 by the Clarendon Press.—BIBLIOGRAPHY: J. D. Campbell, *Life of Coleridge*; H. D. Traill, *Coleridge* (English Men of Letters Series); E. H. Coleridge, *Letters of Samuel Taylor Coleridge*.

COLERIDGE-TAYLOR, Samuel. British musical composer, born in London in 1875, died in 1912. His father was a West African of Sierra Leone, but the boy was brought up under English influences, and studied at the Royal College of Music in London, where he won the composition scholarship in 1893. He wrote for the Birmingham and Leeds festivals, and composed sacred cantatas, chamber music, and songs. Among his works are: *Scenes from the Song of Hiawatha*, *Meg Blane*, and *The Wind Girl of Castèl-Cuillè*. He also wrote the incidental music to some of Stephen Phillips's plays.

COLESBERG. A town of Cape Province, South Africa, 307½ miles from Port Elizabeth, 607 miles from Cape Town, 4407 feet above sea-level, 7 miles from the nearest point on the Orange River. In the South African War, Colesberg, as an advanced post through which a Boer invasion of Cape Colony was feasible, was the scene of repeated conflicts from the commencement of the campaign in Oct., 1899, until the following February, when the Boers retired to the north of the Orange River. Pop. 2400.

COLESEED. A name for a variety of cabbage (*Brassica Napus*) and its seed, which is made into oil-cake for feeding cattle.

COL'ET, Dr. John. An eminent divine, Dean of St. Paul's, and founder of St. Paul's School, London, born 1467, died 1519. His discourses did much to arouse a spirit of religious inquiry, and, together with his liberal and reforming spirit, entitle him to be regarded as one of the pioneers of the Reformation.

COLEUS. A large genus of tropical herbs, nat. ord. Labiatæ. Several species and their hybrids are favourite greenhouse plants on account of their magnificently variegated foliage.

COLIC. A condition of spasmodic pain in the abdomen due to strong contractions of the muscular coats of any hollow tube within the abdominal cavity. Various forms are recognized: such as biliary colic, due to the passage of a gall-stone; renal colic, due to a calculus in the ureter; lead colic, which is intestinal colic, due to lead poisoning; and uterine colic, due to abnormal contractions of the uterus during menstruation. The pain produced by colic is usually very severe, and as a rule sufficiently characteristic, but occasionally it is confused with appendicitis, and much more rarely with other abdominal conditions.

COLIGNY (kol-in-yē), **Gaspard de.** French admiral, born in 1519, distinguished himself under Francis I. and Henry II., who made him in 1552 Admiral of France. After the death of Henry II. Coligny took the Protestant side in the religious strifes of the time, and became the head of the Huguenot party. He was generally unfortunate in the battles he fought, but speedily repaired his defeats by prudence and good management. When peace was made Coligny was received with apparent favour at court. But this was only a blind; and on the night of St. Bartholomew's (24th Aug., 1572) Coligny was basely slaughtered, and his corpse given up to the outrages of the mob.—Cf. L. J. Delaborde, *Gaspard de Coligny*.

COLIMA (kō-lē'mȧ). A town of Mexico, capital of the state of same name, situated in a fertile plain encircled by hills, above which rises the lofty volcano of Colima, which is constantly in a state of eruption.

Pop. 30,000. On the coast about 30 miles S.S.W. of the city is the port Puerto de Colima, or Manzanillo. The state has an area of 2272 miles; pop. 60,845.

COLISE'UM. *See* COLOSSEUM.

COLL. An island on the west coast of Scotland, off Mull, County Argyll, one of the Hebrides, about 12 miles long and from 3 to 3½ miles broad. A great portion of it is moorland, incapable of cultivation; but there are some tracts of light and sandy soil which are tolerably productive. Gaelic is universally spoken. Pop. (1931), 322.

COLLATION. A comparison of one copy or thing of a like kind with another, especially manuscripts and editions of books.

In **canon law**, the presentation of a clergyman to a benefice by a bishop who has the right of patronage. I such a case the combination of the act of presentation and institution constitute *collation*.

In **Roman** and **Scots law** "collation" answers to the English term "hotch-pot."

COL'LECT. A term applied to certain short prayers in the liturgies of various Churches. Some of the collects of the English Church are taken from the old Roman Missal, and are supposed to have been written by St. Jerome. Others are still more ancient; while a few have been added after the Reformation. There is a collect for every Sunday in the year, and a corresponding epistle and gospel.

COLLECTIVISM. A socialistic theory or system based on the doctrine that all the means of production in a State or community should belong to the members of the State or community collectively; that the State should be the only employer, there being no longer a class of capitalists; and that each worker or producer should receive the full value of what he produces, estimated according to the amount of time spent in producing it. The word is new, but the idea is found in every system of Socialism. *See* SYNDICALISM.

COL'LEGE (Lat. *collegium*). In a general sense, a body or society of persons invested with certain powers and rights, performing certain duties, or engaged in some common employment or pursuit. From ancient times there existed in Rome corporations called *collegia*, with various ends and objects. From the fourteenth century on, the word *college* meant in particular a "community or corporation of secular clergy living together on a foundation for religious service."

In Great Britain and America some societies of physicians are called colleges. So, also, there are colleges of surgeons and a college of heralds. The most familiar application of the term college, however, is to a society of persons engaged in the pursuit of knowledge, including the professors, lecturers, or other officers, and the students.

As applied to an educational institution the name is somewhat loosely used. The more advanced colleges are those in which the students engage in study for the purpose of taking a degree in arts, medicine, or other subjects, and are connected with, or have more or less the character of universities.

The early history of these institutions is somewhat obscure; the probability is that they were originally founded in the various universities of the Middle Ages, with similar objects and from the same charitable motives. Hostels or boarding-houses were provided (principally by the religious orders, for the benefit of those of their own fraternity), in which the scholars lived under a certain superintendence, and the endowment of these hostels by charitable persons for the support of poor scholars completed the foundation of a college.

Out of this has developed the modern English college as seen at Oxford and Cambridge, where each college, though a member or component part of the university, is a separate establishment whose fellows, tutors and students live together under a particular head, called *master, principal, warden*, etc., of the college. In Scotland, America, and Germany the college is practically one with the university, the latter body performing all the functions alike, of teaching, examining, and degree-conferring. *See* UNIVERSITIES.

COLLÈGE DE FRANCE. A college in Paris founded by Francis I. between 1518 and 1545, in opposition to the scholasticism of the university. It has no connection with the University of France, and the teaching given there is distinguished by perfect freedom. It is designed to attract scholars other than ordinary university students. The instruction is gratuitous.

COLLEGE OF ARMS. Corporation of English heralds controlling matters affecting armorial bearings and pedigrees, also called the Herald's College. Endowed by Richard III. in 14[illegible] its headquarters are in Derby House, Queen Victoria Street, London, E.C. It deals with all matters affecting the grants and use of coats of arms and armorial bearings.

COLLEGE OF JUSTICE. The supreme civil court of Scotland (that is, the Court of Session), composed of the lords of council and session (the judges), together with the advocates (=barristers), clerks of session, and writers to the signet.

COLLEGIATE CHURCH. In England, a religious house built and endowed for a society or body corporate, a dean or other president, and secular priests, as canons or prebendaries, independently of any cathedral.

COLLEM'BOLA, or SPRING TAILS. A sub-order of small apterous insects, equivalent to the family of Poduridæ of many authors. They can leap into the air by suddenly extending a fork-like appendage that in a state of rest is folded up under the body. The little "glacier fleas" are the best-known examples.

COLLENCHYMA. *See* TISSUES OF PLANTS.

COLLIE. A variety of dog especially common in Scotland, and from

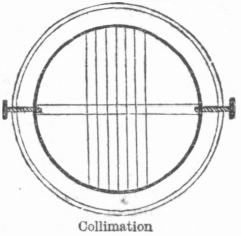
Collie

its intelligence of much use to shepherds. It is of medium size and varies much in colouring, black and white being common, and black with tan-coloured legs, muzzle, etc., being highly esteemed. The head is somewhat fox-shaped, the ears erect, but with drooping points, the tail rather long, bushy, and with a strong curl.

COL'LIER, Jeremy. English divine and political writer, born in 1650, died in 1726. He was educated at Cambridge, and, having entered into orders, obtained the rectory of Ampton in Suffolk in 1679. A zealous opponent of the Revolution of 1688, he was repeatedly imprisoned for his political writings. He is chiefly remembered now for his *Short View of the Immorality and Profaneness of the English Stage* (in which he attacked Dryden and Congreve)—a work of considerable merit which effected a decided reform in the sentiments and language of the theatre.

COLLIER, John Payne. English Shakespearean critic, born in London in 1789, died in 1883. He became known as a critical essayist on old English dramatic literature, and was editor of the new edition of *Dodsley's Old Plays* in 1825. In 1831 his best work, *The History of English Dramatic Poetry*, was published. In 1842-44 he published an annotated edition of Shakespeare in 8 vols.; in 1844 *Shakespeare's Library*. Subsequently he published several editions of Shakespeare, and an excellent edition of Spenser (5 vols., 1862). He made himself notorious by claiming that he possessed a copy of the 2nd Folio Shakespeare, 1632, with many marginal emendations and annotations written in the middle of the seventeenth century, though, as was discovered, these notes were modern fabrications, probably by himself.—Cf. C. M. Ingleby, *Complete View of the Shakespeare Controversy*.

COLLIMATION, Line of. In an astronomical instrument, such as a



Collimation

telescope or transit instrument, the straight line which passes through the centre of the object-glass and intersects at right angles a system of spider-threads placed at the focus of the eye-piece. In a transit instrument the proper adjustment of the line of collimation of the instrument is necessary to accurate determination of the instant at which a heavenly body crosses the observer's meridian, in the course of its apparent motion due to the earth's rotation.

COLLIMA'TORS. Two small subsidiary telescopes used for collimating astronomical instruments, that is, for adjusting the line of collimation, and for determining the collimation error.

COL'LINGWOOD, Cuthbert, Admiral Lord. English naval commander, born at Newcastle-upon-Tyne in 1750. He entered the Royal Navy in 1761, and took part as flag-captain on board the *Barfleur* in Lord Howe's victory of 1st June, 1794,

commanded the *Excellent* during the battle of Cape St. Vincent on 14th Feb., 1797, and was made Rear-Admiral of the White in 1799. But his most distinguished service was at Trafalgar, where his skill and resolution drew warm praise from Nelson. On the latter's death, Collingwood as senior officer took command of the fleet, and gave proof of his judgment and nautical skill in his dispositions for the preservation of the captured vessels. For his services here he was elevated to the rank of baron. He died, while cruising off Minorca in the *Ville de Paris*, on 7th March, 1810.

Collingwood was the model of a naval officer, combining daring courage with cool judgment, and firm discipline with much humanity. His *Memoirs and Correspondence* have been published.

COLLINGWOOD. A port of Canada, province of Ontario, on Lake Huron, with a trade by rail and lake steamer, shipbuilding and other industries. Pop. 5882.

COLLINGWOOD, Baron. English sailor. Born in Newcastle, 26th Sept., 1750, Cuthbert Collingwood saw fighting in the American War of Independence, and on 1st June, 1794, commanded the *Barfleur* against the French, and was a leader in the Battle of Cape St. Vincent. As Nelson's lieutenant at Trafalgar, in the *Royal Sovereign*, he led the second line, and on Nelson's death took command of the fleet. In 1805 he was made a peer. He died 7th March, 1810.

COLLINS, Anthony. English deistical writer, born 1676, died 1729. He was a friend of Locke, who described him as a man who had "an estate in the country, a library in town, and friends everywhere." In philosophy he takes foremost place as a defender of Necessitarianism. His chief works are: *Discourse of Free Thinking, Philosophical Inquiry Concerning Human Liberty, Discourse on the Grounds and Reasons of the Christian Religion, Scheme of Literal Prophecy Considered, Liberty and Necessity,*

COLLINS, John Churton. English literary critic, was born 26th March, 1848, died 12th Sept., 1908. He was educated at King Edward's School, Birmingham, and Balliol College, Oxford. He was a prominent university extension lecturer, and did much to encourage the study of English literature in conjunction with classical literature. He wrote many incisive articles for various periodicals, and was a sworn enemy of humbug and the pretensions of philologists to direct literary studies. He was professor of English literature at Birmingham from 1904 to 1908. His works include a study of *Dean Swift*, and *Greek Influence on English Poetry*.

COLLINS, Michael. Irish politician. Born in 1890, he was educated at Clonakilty and King's College, London. In 1916 he was imprisoned for sharing in the Easter Rebellion, and in 1918 was elected, as a Sinn Feiner, M.P. for South Cork. He organized the Irish Volunteers, and was head of the Republican Army during the warfare of 1920–21. In 1921 he helped to negotiate the treaty with Great Britain, and he became finance minister in the provisional government. As commander-in-chief of the Free State Army, he was conducting the war against the rebels when he was killed, 22nd Aug., 1922.

COLLINS, William. English poet, was born in 1721 at Chichester. While studying at Oxford he wrote his *Persian Eclogues* (1742), afterwards republished as *Oriental Eclogues*. He graduated in 1743, and after some wanderings settled down to try a literary career in London. In 1746 he published his *Odes*, containing pieces which now rank amongst the finest lyrics in the language. The death of an uncle in 1749 put him in possession of £2000, which sufficed to maintain him for the rest of his short life. Disappointed by the reception his poems met with, and unstrung by irregular habits and excitement, he fell into a nervous melancholy, from which he never quite recovered. He died in 1759.—Cf. Dr. Johnson, *Lives of the Poets*.

COLLINS, William. Painter, was born in London in 1788. In 1807 he entered the Royal Academy as a student, and in 1812 he attracted attention by *The Sale of the Pet Lamb*. He was elected an A.R.A. in 1814, and in 1820 he became a full academician. He was in Italy from 1836 to 1838, and permanently damaged his health by painting in the full glare of the noonday sun. He died from heart disease in London in 1847.

Of his numerous works, several of which were very popular in engravings, the following may be named: *The Bird-catchers, Scene on the Coast of Norfolk, The Prawn-catchers, Rustic Civility, As Happy as a King, A Scene near Subiaco, Our Saviour with the Doctors in the Temple, Early Morning.*

He left two sons, William Wilkie Collins (see next article) and Charles Allston Collins (1828–73), who gained some reputation in painting and literature, and married a daughter of Dickens.—Cf. W. Wilkie Collins, *Memoirs of the Life of William Collins.*

COLLINS, William Wilkie. Novelist, elder son of the preceding, was born in London in 1824. He was entered at Lincoln's Inn in 1846, and was called to the Bar in 1851. He began his literary career with a life of his father (1848), and in 1850 he published *Antonina*, a novel written some years before. He became an intimate friend of Charles Dickens, collaborated with him in several books, and contributed to *Household Words* and *All the Year Round*.

His best novels, however, which are remarkable for ingenious plot-weaving, were entirely his own. They include: *After Dark* (1856), *The Dead Secret* (1857), *The Woman in White* (1860), *No Name* (1862), *Armadale* (1866), *The Moonstone*, (1868), *Man and Wife* (1870), *The New Magdalen* (1873), *The Law and the Lady* (1875), *The Two Destinies* (1876), *Heart and Science* (1883), *The Evil Genius* (1886), and *The Legacy of Cain* (1888). Some of these were dramatized by him. He suffered from ill-health throughout almost all his life, and died in London in 1889.

COLLISION. In maritime affairs, the impact of one ship with another, or with a pier or other maritime structure, floating or fixed. If, as is usual, injury results and the collision was due to negligence in navigation or in the equipment of the ship or ships involved, the owner of each ship in fault is liable in damages. If more than one ship is to blame, the total loss is apportionable among the respective owners in proportion to the degree of fault of their ships (see Maritime Conventions Act, 1911).

In all cases the liability of a shipowner for such damage is limited—in cases of damage to ship or cargo or both, to £8 per ton of the gross tonnage of his vessel; and in the case of loss of life or personal injury, to an additional £7 per ton (see Merchant Shipping Acts, 1894 and 1906). Since 31st Dec., 1917, the shipowner is no longer protected from such liability by the fact that his vessel was in charge of a compulsory pilot responsible for the negligence in question (see Pilotage Act, 1913).

To entail any liability for collision, negligence or fault must be proved. Thus where collision occurs through inevitable accident, i.e. not preventable by ordinary maritime skill and care, e.g. a storm of extraordinary violence or latent defect in the steering-engine, no liability for damages emerges.

The test of negligence in most cases is the code of Navigation Rules, known as *The Regulations for Preventing Collisions at Sea*, approved by the Admiralty and the Board of Trade, and enacted by Order in Council under the Act of 1894. The *Regulations* contain exhaustive rules for sailing and steering, giving whistle signals and the exhibiting of lights. Until 1911 any departure from the *Regulations* was conclusive evidence of negligence unless absolutely necessary to avoid collision. But by the Maritime Conventions Act of that year such breach is now only prima facie evidence of fault, rebuttable by proof that the collision was not due to the breach in any reasonable sense. By international conventions practically all vessels are bound to obey these or similar regulations.—BIBLIOGRAPHY: R. G. Marsden, *Treatise on the Law of Collisions at Sea*; Sir H. S. Maxim, *A New System for preventing Collisions at Sea*; D. W. Smith, *Law relating to the Rule of the Road at Sea*.

COLLO'DION. A substance prepared by dissolving pyroxyline (gun-cotton) in ether, or in a mixture of ether and alcohol, which forms a useful substitute for adhesive plaster in the case of slight wounds. In a slightly modified form collodion is also employed in photography.

COLLOIDS. Substances which pass through certain membranes very slowly indeed, or not at all, are classed as colloids, to distinguish them from crystalloids, or substances which pass through the membranes quickly.

Thomas Graham was the discoverer of the characteristic properties of colloids. He separated a dilute solution of sodium silicate from pure water below it by means of a membrane of vegetable parchment, and then added dilute hydrochloric acid to the silicate. He found that the crystalloidal sodium chloride formed by the reaction passed through the membrane into the pure water below, whilst the resulting silicic acid in solution remained above.

The separation of substances by means of diffusion through a membrane is called dialysis, and the reason for the non-diffusion of a colloid is held to-day to be due to the size of the particles comprising the colloid being too great to allow the substance to pass through the interstices of the membrane.

Most substances known in the crystalloidal state can be obtained in the colloidal state, but some substances, e.g. the proteins, are as yet only known in the colloidal state. Practically all the most important metals have been obtained in the colloidal state, and then these metals have special properties. The most important organic substances in the colloidal state are starch, the dextrins, the gums, the tannins, rubber

latex, glue and gelatine, the caseins and albumins, invertin, emulsin, trypsin, and cell protoplasm.

Colloidal solutions are called sols, those whose solvents are organic are called organosols, and with water, alcohol, glycerine, etc., as solvents the solutions are called hydrosols, alcosols, glycerosols respectively. The sols contain at least two phases—a liquid or solvent, and a liquid or very finely divided solid therein. The sol may appear homogeneous to the eye, and is only found to be heterogeneous by the ultra-microscope; it is then called microheterogeneous. In gels which have been caused to swell, this heterogeneity is visible to the eye; they are called macroheterogeneous. The "solvent" is called the *dispersion medium*; it has its particles in contact, and is one phase; the mass of isolated particles is called the *disperse phase*. Some colloids have a network of fibrous structure instead of being composed of isolated particles. The state of division of the disperse phase is called the degree of dispersion or colloidal refinement.

Properties.—The density of a colloidal solution is greater than that arithmetically calculated from its dispersion medium and its disperse phase, i.e. the colloidal solution or the *dispersoid* exhibits a volume contraction.

Osmotic Pressure.—This is very small indeed, and may be due to traces of impurity and errors of observation. The freezing- and boiling-points of hydrosols are almost those of pure water, but a colloid in different dispersion media may behave differently; thus tannic and gallic acids in water exhibit no depression of the freezing-point, but in acetic acid give deviation corresponding to the molecular weight.

Diffusion —Generally a crystalloid will diffuse quickly, a dispersoid only very slowly indeed, but this rate varies with the degree of refinement, the membrane, the dispersion phase, and the nature of the colloid itself.

The Brownian Movement.—Under suitable conditions the particles in the disperse phase can be seen to be in violent vibratory motion about a fixed mean position. This was discovered by Brown in 1827, and the phenomenon is named after him. But the particle must be smaller than 3 to 5μ (1μ or micron = ·001 mm.). It is supposed that the internal heat energy is the cause of the movements discovered.

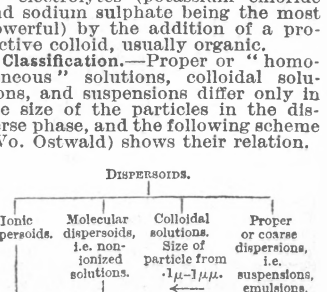
Optical Properties.—Most hydrosols appear homogeneous to the naked eye, but if an intense beam of light is passed through a colloidal solution, and the illuminated field be viewed at right angles to the beam, the light is found to be diffracted by the dispersed particles.

Electrical Properties.—In water dispersion, metallic hydroxides, silicic acid, and basic dyes like methyl-violet and methylene-blue have a positive charge. All metals, metallic sulphides, aniline-blue, indigo, fuchsin, eosine, etc., including gamboge and starch, have a negative charge. The character of the charge depends on the dispersion medium in most cases. Under the influence of a potential difference, the positively charged disperse phase moves to the cathode, and the negatively charged disperse phase moves to the anode. This "wandering" under electrical influence is called cataphoresis. The electrical conductivity of colloidal solutions is generally very small, and is much less than for dissociated substances.

Transformations. — The disperse phase may be coagulated by heat, by mechanical means, by concentration, or by the addition of electrolytes. When an insoluble substance separates out, it is called a gel, which, if it is obtained from a hydrosol and it retains water, is called a hydrogel. If the precipitated substance is dried and is soluble in the solvent to give a colloidal solution, the coagulation is termed reversible, e.g. gelatine, glue, gum, tungstic and molybdic acid hydrosols are reversible; stannic acid, ferric oxide, alumina, gold, silver, and the platinum hydrosols are irreversible.

A protective colloid is one which is added to an irreversible colloid and converts it into a reversible one. Thus an inorganic hydrosol may be protected from the coagulation caused by electrolytes (potassium chloride and sodium sulphate being the most powerful) by the addition of a protective colloid, usually organic.

Classification.—Proper or "homogeneous" solutions, colloidal solutions, and suspensions differ only in the size of the particles in the disperse phase, and the following scheme (Wo. Ostwald) shows their relation.


Dispersoids.
Ionic dispersoids.
Molecular dispersoids, i.e. non-ionized solutions.
Colloidal solutions. Size of particle from ·1μ–1$\mu\mu$.
Proper or coarse dispersions, i.e. suspensions, emulsions, etc.
Size of particle less than 1$\mu\mu$.
Decreasing degree of colloidity.
Size of particle greater than ·1μ.
Increasing degree of dispersion.

Dispersoids in the border-line of any division will have some properties of each class, with a gradation in properties as the degree of dispersion diminishes.

Methods of Preparation :

Chemical Methods.—Hydroxides and silicic acid, etc. By double decomposition with the appropriate substances, ferric hydroxide is obtained by prolonged boiling of ferric acetate with the addition of steam, or by the addition of ferric chloride to a large bulk of boiling water, or by saponification of ferric ethylates.

Alumina may be obtained by dialysing freshly precipitated and washed aluminium hydroxide dissolved in aluminium chloride; similarly for chromium hydroxide.

Silicic acid may be obtained by dialysing the mixture of dilute hydrochloric acid and sodium silicate solution, or by prolonged boiling of freshly precipitated and washed silicic acid.

The sulphides are obtained by passing sulphuretted hydrogen through solutions under certain conditions, e.g. in neutral aqueous solution of arsenic trioxide, sulphuretted hydrogen gives colloidal arsenic sulphide.

Copper sulphide is obtained colloidal by prolonged washing of the precipitate from neutral or ammoniacal copper salt solutions. It is brown and transparent when dilute, black when concentrated, with a fluorescence in reflected light. Similar methods are used for other sulphides.

Colloidal elements are obtained by reduction in suitable media. Thus selenium hydrosol is obtained by reducing selenic acid with sulphur dioxide solution. Similarly, reduction methods serve for gold, silver, the platinum metals, mercury, and copper; or the metals may be reduced in the presence of protective colloids, as in Paal's method. Hydrazine, hydroxylamine, etc., may be also used as reducing agents.

Electrical Methods.—Bredig showed that gold and the platinum metals in the form of wire may be used as the terminals for the production of a small electric arc using a direct current. The metal is torn off in a cloud, and under water gives a colloidal solution.

Svedberg improved the method by using the metal as foil suspended in the dispersion medium, and pounded it by uniform oscillatory discharges between two electrodes which are more difficult to pulverize than the foil, e.g. aluminium and iron. He obtained the alkaline earths and alkali metals in colloidal form, bismuth, mercury, carbon, silicon, selenium, etc., and minerals such as magnetite, copper glance, etc.

Colloidal chemistry is one of the most recent branches of chemical knowledge to be pressed into the service of man. It is of fundamental importance in agriculture, medicine, mineralogy, glass manufacture, and photography; in fermentation processes, in tanning, in dyeing, and in the industries which deal with earthenware clay, cement, sugar, rubber, starch, gum, gelatine, nitrocellulose, and celluloid. In the textile industries, in breadmaking, in the petroleum and asphalt industries, in the paint and varnish industry, and in many departments of physiological and biochemical science colloids play a very large part. BIBLIOGRAPHY: J. Walker, *Physical Chemistry*; W. C. M'C. Lewis, *Physical Chemistry; British Association Reports on Colloid Chemistry; Joint Conference of the Faraday and Physical Societies on the Physics and Chemistry of Colloids* (reported in the *Chemical Age* of 30th October, 1920).

COLLOT D'HERBOIS (kol-ō dăr-bwä), **Jean Marie.** French revolutionary, born at Paris in 1750. Prior to the Revolution he was an actor in the provinces and a dramatist, but on its outbreak he went to Paris, and soon became prominent as a leader of the Mountain or extreme party. After filling several missions, he was sent by Robespierre along with Fouché to Lyons in 1793, with almost unlimited powers, and was guilty of the most flagrant enormities. Returning to Paris, he became a determined opponent of Robespierre, and, being chosen president of the Convention (9th July, 1794), contributed to his fall. Soon after he was banished to Cayenne, where he died in 1796. His works include: a play called *Le paysan magistrat*, and the *Almanach du Père Gérard*, a book written in praise of a constitutional monarchy.

COLLOTYPE. In photography, a thin gelatine plate which, being sensitive to the sun's rays, has received a photographic impression that may be impressed directly on paper by means of printer's ink.

COLLU'SION. In law, a secret agreement between opposing litigants to obtain a particular judicial decision on a preconcerted statement of facts, whether true or false, to the injury of a third party. As applied to divorce proceedings it has been defined thus: "The presenting or prosecuting of a petition for divorce, by arrangement or agreement between the parties, such arrangement or agreement being contrary to the law of this country." Collusion is an absolute bar to divorce, both in England and Scotland.

COL'MAN, George ("the Elder"). Dramatist, was born in 1732 in Florence, where his father was envoy. His education was directed, after his father's death, by his uncle, William Pulteney, Earl of Bath, who sent him to Westminster School and Christ Church, Oxford. He was called to the Bar at Lincoln's Inn, but an intimacy with Garrick led him to write for the stage.

He was very successful with *The Jealous Wife*, a comedy, produced at Drury Lane in 1761. *The Clandestine Marriage*, written in collaboration with Garrick, followed in 1766, and he afterwards wrote or adapted many other plays. He purchased Covent Garden Theatre in 1767, and ran it till 1774. Two years later he acquired the Haymarket Theatre, and managed it till 1789. He died insane in London in 1794. He translated Terence, and Horace's *Ars Poetica*, and published miscellaneous essays.—Cf. R. B. Peake, *Memoirs of the Colman Family*.

COLMAN, George ("the Younger"). Dramatist, son of the preceding, was born in London in 1762. Educated at Westminster School, Christ Church, Oxford, and King's College, Aberdeen, he was intended for the Bar, but soon turned to literature and the theatre. He succeeded his father as manager of Haymarket Theatre in 1789, and on his death became its patentee.

Of his many dramas the most successful were: *The Heir-at-Law* (1797); *The Poor Gentleman* (1802); *John Bull, or An Englishman's Fireside* (1803); *Love Laughs at Locksmiths* (1803). From 1824 till his death in 1836 he was examiner of plays. He lived an extravagant life, and was often engaged in literary feuds. *Random Records* (1830) is an autobiography.

COLMAN, Ronald. English film actor. Born at Richmond, 7th Feb., 1891, he entered the army in 1909 and saw service in the Great War. In 1919 he married Thelma Ray, and in 1920 he went to America and became famous. Among the pieces in which he appeared are *Beau Geste*, *Bulldog Drummond*, and *Arrowsmith*.

COL'MAR, or KOLMAR. A city in Upper Alsace, on the Lauch, 10 miles W. of the Rhine, 39 miles S.S.W. of Strasbourg. It has manufactures of printed goods, calicoes, and silks, besides cotton-mills, ironworks, and tanneries. It was united to France in 1697, by the Peace of Ryswick, surrendered to Germany by the Treaty of Versailles, 26th Feb., 1871, and returned to France by the Treaty of Versailles in 1919. Pop. 46,518.

COLNE (kōn). A borough of England, in the county of Lancashire, and 31 miles S.E. of Lancaster. The chief manufactures are cotton goods. Pop. (1931), 23,790.

COLNE. A small river in the W. Riding of Yorkshire, a tributary of the Calder, giving name to the Colne Valley parliamentary division in the south-west of the county.

COLOCA'SIA. A genus of plants, nat. ord. Araceæ, having leaves and tubers which are acrid. The latter contain much starchy matter, and they are used as food in the south of Europe after the acrid matter is separated by washing or boiling. *C. esculenta*, *C. macrorhiza*, and others furnish the *taro* of the Pacific Islands.

COL'OCYNTH. The fruit of *Citrullus Colocynthus*, the dried and powdered pulp of which is used in medicine as an aperient. It is sometimes known as *Bitter-gourd* or *Bitter-apple*.

COLOGNE (ko-lōn'), Ger. *Köln* (kœuln). A city of Germany, on the left bank of the Rhine, forming, in connection with Deutz, which serves as a bridge-head on the opposite side of the river (across which is a bridge of boats and an iron railway and general traffic bridge), a fortress of the first rank. The old fortifications, dating from the thirteenth century, have been swept away, and the town is now defended by a series of detached forts.

The town itself has been improved and extended, but Cologne is still irregularly built and largely in the antique style. There are many fine old buildings as well as excellent modern ones; the churches in particular are interesting. The most important edifice of all is the cathedral, begun in 1248, one of the finest and largest Gothic structures in Europe. It was only completed in the nineteenth century. Between the years 1818 and 1884 over £1,000,000 was expended on it. It is in the form of a cross; its entire length is about 445 feet; breadth, 200 feet; height to ridge of roof, 202 feet; height of the two western towers, between which is a grand portal, 520 feet, being thus among the highest edifices in the world. The council-house, museum, and the great St. Martin Church with its imposing tower should also be mentioned.

The manufactures include sugar, tobacco, glue, carpets, leather, machinery, chemicals, pianos, and the celebrated *eau de Cologne*. The trade by river and railway is very

great. Of the newspapers published at Cologne the most important is the *Kölnische Zeitung*, or *Cologne Gazette*.

History.—Cologne is of pre-Christian origin, and was originally called *Oppidum Ubiorum*, being the chief town of the Ubii, a German nation. The Romans made it a colony A.D. 51, and called it *Colonia Agrippina* (whence the name *Cologne*). It was annexed to the German Empire in 870, and became one of the most powerful and wealthy cities of the Hanseatic League. In 1792 it ceased to be a free city. It was taken by the French in 1794, ceded to them by the Treaty of Lunéville in 1801, and restored to Prussia in 1814. Cologne was occupied by the Allied troops after the armistice of 1918, Sir Herbert (now Lord) Plumer entering the town on 12th Dec. Pop. 700,222.

COLOGNE EARTH. A kind of ochre, of a deep-brown colour, a durable pigment in water-colour painting. It is an earthly variety of lignite or partially fossilized wood.

COLOGNE YELLOW. A pigment consisting of 2 parts yellow chromate of lead, 1 of sulphate of lead, and 7 of sulphate of lime or gypsum. It is prepared by precipitating a mixture of nitrate of lead and nitrate of lime with sulphate of soda and chromate of potash.

COLOMBES (ko-lôṅb). A town of France, 7 miles N.W. of Paris, near the Seine. Pop. 42,590.

COLOM'BIA, Republic of. Formerly called New Granada, a republic of South America, consisting of fourteen departments, three "intendencies," and six commissaries. Area, 447,536 sq. miles; pop. 7,851,000. The boundary-lines with Brazil and Peru are still undefined, but frontier difficulties with Venezuela were settled in 1922. A boundary treaty was signed with Ecuador in 1917. The chief towns are Bogotá (the capital), Medellin, Barranquilla, Cartagena, Bucaramanga, Manizales, Cali, and Cúcuta.

Late in 1903 the department of Panama proclaimed itself an independent republic, and was at once recognized by the United States, which concluded with it an agreement for the construction of a canal across the isthmus. In 1914, Colombia signed a treaty with the United States, recognizing the independence of Panama, and receiving in return $5,000,000 and certain rights in the Panama Canal zone. The treaty was ratified in 1921.

Physical Features.—According to surface conformation the country may be divided into the elevated region of the Cordilleras in the west, and that of the low-lying lands in the east. The former occupies the greater portion of the country, and presents a richly diversified surface, being formed chiefly of three mountain chains which stretch north and south in a nearly parallel direction, enclosing between them the valleys of the Rivers Cauca and Magdelena. These, the two great navigable rivers of the country, flow northwards, joining their waters about 120 miles from their embouchure in the Caribbean Sea.

In the central ridge is the culminating point of Colombia, the volcano of Tolima, 18,432 feet high. The low lands of the east form a transitionary region between the plains of North Brazil and the llanos of the Orinoco region, the drainage being carried to the Amazon and Orinoco. The chief coast indentation is the Gulf of Darien, which receives the navigable Rio Atrato.

Climate.—The climate is naturally as varied as the surface of the country, but in a great part of the republic it is very hot. At Cartagena, on the Caribbean Sea, and on the Pacific coast, yellow fever is endemic at some places; while in the elevated country, as the plain of Bogotá, 8563 feet above the sea, the climate is perfectly salubrious, and the temperature seems that of eternal spring.

Minerals, Fauna, and Flora.—The flora is rich and luxuriant. A great part of the country is still covered with virgin forests, which yield excellent building-wood, Peruvian bark, caoutchouc, and vanilla. The fauna includes the jaguar, puma, tapir, armadillo, sloth, various species of deer, and the gigantic condor.

The mineral wealth is various and abundant, and comprises coal, gold, silver, emeralds, and salt. Nearly all the emeralds mined come from Colombia. Maize, bananas, and plantains are the chief articles of food. Tobacco and coffee are cultivated and exported. Sugar is also grown.

Trade and Industry.—Manufactures can scarcely be said to exist. The Panama-hat industry, however, is making great strides. The chief ports are Sabanilla, the port of Barranquilla, and Cartagena. The loss of the Isthmus of Panama has deprived Colombia of much of its commercial importance. The foreign trade of the country is chiefly with Britain and the United States. The exports are chiefly precious metals, hides, coffee, and tobacco; the imports, manufactured goods. The exports and imports for 1930 were valued at £22,541,710 and £12,568,218

respectively. The total length of railways open in 1930 was 1846 miles; about 2480 miles are under construction. The money standard is the *peso* or dollar, nominal value, 4*s*.

Constitution.—By the constitution, as amended in 1886, the executive power is vested in a President, elected for four years, the legislative power in a congress of two Houses—the Senate and the House of Representatives. The former consists of thirty-four representatives, elected for two years indirectly by electors specially chosen for the purpose; the latter of ninety-two representatives, elected by universal suffrage for four years, one for every 50,000 inhabitants. The President is elected by direct vote of the people for his term of office. The present President of the Republic of Colombia, Dr. Enrique Olaya-Herrera, was elected on 10th Feb., 1930; he holds office till 1934. The revenue for 1931 was 43,614,101 gold pesos, and the expenditure 52,203,930.

History.—New Granada was discovered by Alonso de Ojeda in 1499; it was visited by Columbus on his fourth voyage, in 1502. The first Spanish settlement was made in 1510 at Santa Maria in the Gulf of Darien, and the whole country was formed into a province under a captain-general in 1547. New Granada declared its independence of Spain in 1811, and after eleven years of warfare succeeded with the help of Venezuela in effecting its liberation.

Both states then united with Ecuador, also freed from Spanish domination, to form the first Republic of Colombia; but internal dissensions arising, the three states again separated in 1831, forming three independent republics, which have had a very troubled existence. In 1861 the states forming New Granada by agreement adopted a new constitution, the republic henceforth to be called the United States of Colombia. This title was retained till, by the new constitution adopted in 1886, the state ceased to be a federal republic and became a unitary republic, with the name of Republic of Colombia.

The secession of Panama in 1903 was brought about by the failure of the Bogotá Government to sanction the construction of the Canal, which would, it was expected, bring material profit to the people of Panama. A treaty with the U.S.A. was signed in 1922 recognizing its independence; Colombia received 50 million dollars as compensation.—BIBLIOGRAPHY: R. S. Pereira, *Les États-Unis de Colombia*; F. L. Petre, *The Republic of Colombia*; R. Nuñez and H. Jalhay, *La République de Colombia*; P. J. Eder, *Colombia*; V. Levine, *Colombia*.

COLOM'BO. A seaport town, the capital of Ceylon, on the south-west coast, and about 70 miles W. by S. of Kandy, with which it is connected by railway. It is a pleasant town with an extensive fort, within which are some of the best houses, and which occupies a projecting point of land. On the east side of the fort, on the margin of the sea, is the Pettah, or Black Town, inhabited chiefly by Singhalese, while in the outskirts are most of the houses occupied by the English. The public buildings comprise the Government offices, Government house, supreme court, and museum. Through the construction of a breakwater and other works there is now excellent harbour accommodation, and numerous vessels call there. Pop. 284,155.

COLOM'BO. *See* CALUMBA.

CO'LON (Gr. *kôlon*, miswritten and mispronounced as *kōlon*). The greater portion of the large intestine, which lies between the cæcum and the rectum, or terminal portion. In man it is about 4½ feet long, and forms a series of ponches in which the digested food is for a time detained. In an animal of medium size its length is about 10 feet, and its capacity about 16 gallons. It is itself believed to have some digestive power.

COLON', or **ASPINWALL** (the former is the official name). A free port of Panama, on Manzanillo Island, on the north side of the Isthmus of Panama, at the Atlantic extremity of the interoceanic railway, and near that of the Panama Canal. Established in connection with the railway, it had an important transit trade before the canal was begun, and since then the place has been entirely transformed, a new town with wide and regular streets having been built on a tract of land reclaimed by the Canal Company. There is extensive harbour accommodation. Pop. estimated at 33,000.

COLONEL (kėr'nel). The commander of a regiment, whether of horse, foot, or artillery. Any rank above a colonel constitutes the bearer of it a general officer. In the British service the rank of colonel is honorary, except in the artillery, engineers, and staff, and is usually bestowed upon officers of superior rank and princes of the blood. The actual commander of the battalion is the lieutenant-colonel. In March, 1920, however, the title of brigadier-

general was abolished; officers in command of a brigade were known as "colonels commandant" until 1928, when the appellation "brigadier" (not brigadier-general) was introduced.

COLONIAL LITERATURE.

Australian Literature.—The centenary of settlement, celebrated in 1888, may appropriately be regarded as separating the first era of Australian literature from the second. It is possible that the war years of 1914-18 have inaugurated a third. By 1888 the earlier writers, native-born or adoptive, were either past or passing, and about that year creative literature, local and racy of the soil, began in some measure to repay for publication. Australia's muses had to pass through their infancy, and even after first learning to speak they received small attention. Consequently some early sweetness was wasted on desert air by devotees whose aspirations and efforts ended in disappointment. Such, however, is common for the pioneer, and it was not anomalous in Australia.

The first era produced three notable novels and two finely gifted poets. Henry Kingsley (1830-76) in *Geoffrey Hamlyn* has described the life of the gentlemen "squatters" of the old colonial days while "the system" was still in existence to afford labour, and sometimes to annoy with bushrangers. One must know and love the country to realize the height of Kingsley's achievement. Professor Saintsbury has remarked upon the especial excellence of the early scenes in Devonshire; the Australian reader will recognize the rarer excellence displayed in catching, at the first attempt, the fascination of the new country. In *The Hillyars and the Burtons* also, Henry Kingsley takes his characters to Australia, but beyond one clever study of a feminine type produced by the colony, and one for which the local poet-patriot, William Charles Wentworth, seems to have been the model, the book has much less in it of interest.

The tragic novel *For the Term of his Natural Life* by Marcus Clarke (1846-81) is a still greater thing than H. Kingsley's masterpiece, and stands at the summit of Australian prose-fiction. It is a lurid picture of the old penal system—that baleful inubus to free and virile Australia in its early days.

The third novel is "Rolf Boldrewood's" *Robbery under Arms*, a realistic story of the gold era following 1851, when the forced conveyance of precious freights through miles of lonely bush invited highway robbery and sensational happenings. Rolf Boldrewood was the pen-name of the recently deceased T. A. Browne (born 1826), a prolific author of Australian fiction, including: *The Squatter's Dream, A Sydney-side Saxon, Nevermore, The Miner's Right*, and *Old Melbourne Memories*. Later Australian novels are copious, competent, and—undistinguished.

But the poetry of the first era is of greater interest than its fiction. The two principal names are Adam Lindsay Gordon (1833-70) and Henry Clarence Kendall (1841-82), the former Anglo-Australian, the latter native-born. On the tragic death of Gordon, Kendall said that he "sang the first great lays these lands can claim," which is true, for both the rhetorical efforts of William Charles Wentworth (1793-1872) in his *Australasia* (1823), and the four volumes issued by Charles Harpur (1817-68) lack distinction though they have merits and are of interest.

Gordon's poetry, often unpolished, is never without the authentic note, and though some of his best work, such as the *Sick Stockrider* and *A Dedication*, are solely inspired by his adopted country, good judges hold that his supreme achievement lies in a specimen of that "knightly song" of which Europe and not Australia is the natural home. Francis Adams (1862-93), an intimate critic of Australians and their literature, regarded *The Rhyme of Joyous Garde* as the greatest poem yet written under the Southern Cross. Of Gordon's fiery handling of an Arthurian theme these lines are a fair example:

> Then a steel-clad rush and a steel-clad ring,
> And a crash of the spear staves splintering,
> And the billowy battle blended.
> Riot of chargers, revel of blows.
> And fierce-flushed faces of fighting foes
> From croup to bridle, that reel'd and rose,
> In a sparkle of sword-play splendid.
>
> And the long lithe sword in the hand became
> As a leaping light, as a falling flame,
> As a fire through the flax that hasted;
> Slender and shining and beautiful,
> How it shore through shivering casque and skull,
> And never a stroke was void and null,
> And never a thrust was wasted.

His galloping rhymes of hunt and race-course are unsurpassed in English: his bush ballads were the first of their kind, and have been an inspiration to his Australian successors—"A shining soul with syllables of fire" (Kendall). But Kendall's, not Gordon's, is "the hand with the Harp of Australia." Henry Clarence Kendall's best work appeared originally in *Leaves from an*

Australian Forest (1869) and *Songs from the Mountains* (1880), now collected in a single edition. His sad hard life accounts for the inchoateness of the glory of this great artist, whose technique is consummate, and whose lyrical flow never fails.

Though Gordon's verse is full of fire and music, his best remembered lines are mostly poignancies "rudely strung with intent less of sound than of words":

I should live the same life over if I had to live again,
And the chances are I go where most men go.

Enigmas that perplex us in the world's unequal strife
The future may ignore or may reveal,
Yet some as weak as water, Ned, to make the best of life
Have been to face the worst as true as steel.

Life is mostly froth and bubble.
Two things stand like stone.
Kindness in another's trouble,
Courage in your own.

But Kendall haunts one with the magic of his phrase, and it is this quality that makes one pore over his felicities—as, for instance, in his *Glen of Arrawatta*, a "settler's story of the wild old times" of murder by the blacks, inimitably told; or in the more darkly tragic *Cooranbean, or A Death in the Bush*. His melody is liquid and incessant, his images fresh and vivid. Who that has seen a curious koala or a startled opossum (phalanger) peering from the branch of a eucalypt will not delight in this:

Behold the gem-like eyes
Of ambushed wild things stared from bole and brake
With dumb amaze and faint recurring glance;

or in the wonderful second line of the following:

When flat as reptiles hutted in the scrub,
A deadly crescent crawled to where he lay,
A band of fierce fantastic savages,
That starting naked round the faded fire,
With sudden spears and swift terrific yells,
Came bounding wildly at the white man's head,
And faced him, staring . . .;

or in these melodies from *The Hut by the Black Swamp*, where sibilants suggest the singing of birds:

Nor comes the bird whose speech is song,
Whose songs are silvery syllables,
That unto glimmering woods belong,
And deep meandering mountain dells
By yellow wells.

But rather here the wild dog halts,
And lifts the paw, and looks and howls;
And here in ruined forest-vaults
Abide dim, dark, death-featured owls,
Like monks in cowls.

Across this hut the nettle runs,
And livid adders make their lair
In corners dank from lack of suns. . . .

After these two, the names of the second era come in considerable numbers. James Brunton Stephens (1835-1902) wrote *Convict Once* (a long monodrama), and other poems and short prose fiction more distinguished for wit than poesy. John Farrell (1851-1904) appears with *How he Died*, and other pieces inspired by the poems of Gordon, in the quick narrative style developed later by two of the most prolific and popular of Australian poets.

The two books of Andrew Barton Paterson (born 1864) containing *The Man from Snowy River, Rio Grande's Last Race*, and many other verses, have sold by scores of thousands. They are rhymes of the bush, the "road" (stock-routes), and the racing-track, always characteristic, and frequently suffused with true poetic feeling.

In reflecting the life of the "back-blocks," the plains, and the ranges, Paterson's "banjo" strains are countered by the generally more sombre note of Henry Lawson's popular lyre. Henry Lawson (born 1867) is the author of *While the Billy Boils, When I was King, On the Track and over the Slip-rails*, and many other volumes of vivid poetry and strong impressionistic fiction. He is perhaps the finest writer of the short story yet arisen in Australia; other memorable names in this connection being "Price Warung" (for his gruesome tales of "The System"), Randolph Bedford, Steele Rudd (for *On Our Selection*, etc.), J. H. M. Abbott ("Tommy Cornstalk"), and a dozen or so more whose work has mostly been brought to light by *The Sydney Bulletin*—that nursing-mother of later Australian literature.

The ill-fated Barcroft Boake (1866-92) will live by one poem, *Where the Dead Men Lie*, which springs in tragic truth from what C. E. W. Bean (born 1879, the official historian of the Australian Imperial Force) in his first prose masterpiece, *On the Wool Track*, calls the "real" (that is to say, the interior) Australia, while Will Ogilvie (born 1869) in *Fair Girls and Gray Horses, Hearts of Gold*, etc., and some other competent writers (as, e.g. Mrs. Æneas Gunn in her monograph *We of the Never Never*) reveal its pleasanter phases in prose or verse. G. Essex Evans (1863-1909), Victor Daley (1858-1905), E. J. Brady (born 1869), and J. Le Gay Brereton (born 1871), have published much graceful verse of wider scope and variety.

The two poets of power appear, Chris Brennan (born 1870) and Bernard O'Dowd (born 1866), whose earlier verses are strongly influenced by the French Symbolists. Their work is full of interest, but difficult

to quote from. Brennan's finest poem is perhaps *The Chant of Doom*, inspired by the war. Bernard O'Dowd reaches his acme in *The Bush*, a splendid poem in stanzas of an uncommon structure. It envisages "that wild dreamland called the Bush" as the womb from which the epic of Australia shall spring, and adumbrates its speedy birth. One fancies that the young Leon Gellert, whose *Songs of a Campaign* (Gallipoli) place him easily first among Australia's soldier-poets, had Bernard O'Dowd's poem in mind when he penned his sonnet *The Australian Muse*:

Uplift thy lyre and touch the tender strings;
But leave unsung the epics of thy land
Till thou and Time have made a song both grand
And mellow with thy long imaginings. . . .

Gellert thinks the time is not come for that epic, but that the unripe must first "ripen with the years." If war has not wasted him, he may himself be destined to "add rhyme to gloried rhyme" as time goes on. Two poetesses of exceptional promise share this chance with him, Dorothea Mackellar, already the authoress of one household song, *My Country*, and Zora Cross, whose work, and especially *The Burden of Eve*, is in its best episodes of major quality.

In conclusion, though there are many others who have written and published much, one may record the great success of C. J. Dennis's rhymed stories, *A Sentimental Bloke*, *The Moods of Ginger Mick*, etc., the characters in which are not idealized bushmen, but denizens of city slums—or the Australian equivalent thereof—members of the 'larrikin" class in fact, glorified by the limelight of sheer melodrama; while Miss Ethel Turner deserves mention for her highly popular stories of child life in Australia. Two good anthologies of Australian poetry, that by Bertram Stevens (Golden Treasury Series) with chronological and bibliographical notes, and *The Oxford Book of Australasian Verse*, will serve as guides to much Australian literature which for reasons of space cannot here be noticed.

Canadian Literature.—It is usual to begin with a warning that in the way of literature Canada has not yet achieved anything great. The wonder would be if the fact were otherwise. Little more than a century and a half has passed since the fall of Quebec decided her destiny, gave her the reasonable peace of settled government, left her free to set her house in order, and turn to cultivating the arts and graces. The conditions of life in any new land are inimical to the pursuit of literature; there is no atmosphere of culture to foster it; no leisure, nothing to induce the mood for its enjoyment. For the time it is more important to reclaim the wilderness, build cities, sow and reap, and develop a social system than to write books or to read them. And during the mere century or so since circumstances began to be favourable to her literary growth, Canada has made at least as much progress in letters as any new nation ever compassed in so brief a period.

To say, with the hypercritical, that in the main this literature is not distinctively Canadian is to say no more than that Fréchette, Chauveau, Sulte, and other French-Canadians, like the majority of English-Canadian authors, have naturally drawn inspiration from the literary traditions and influences of their ancestry. But from the beginning there were always writers in whom these inherited traits have been mitigated by independent differences of thought and manner, differences that are indigenous and, with the development of national consciousness, bid fair to give Canada, in due season, a literature that shall be her own in the fullest sense of the term.

Probably no writer has been more distinctively Canadian than the first outstanding figure in the literary annals of the dominion. Thomas Chandler Haliburton (1796-1865) was born and educated in Nova Scotia, and if, by his creation of the shrewd old philosopher whose homely wit and satire took the world by storm in *The Clockmaker, or Sayings and Doings of Sam Slick of Slickville*, he did not originate the vein of humour that is now accepted as typically American, he certainly shares that honour with the American Seba Smith, who published his *Letters of Major Jack Downing* in 1833, only two years before Sam Slick began his serial appearance in the *Nova Scotian*.

The popularity of Sam Slick has waned; his humour, suffering the common lot of the humour of dialect and current affairs, has lost its bloom and become old-fashioned, but in its day it was as fresh and effective as that of his successor Mr. Dooley is in ours. None of Haliburton's other books added to his reputation, and it is chiefly as a pioneer in the discovery of a fresh type of humorous character that he still survives in literary history.

No names in earlier Canadian poetry stand above those of Charles Heavysege, Isabella Valancy Crawford, Charles Sangster, and Archibald Lampman. Heavysege was a Mon-

treal journalist; his poverty, his solitary habits, his Byronic gloom helped to invest him with a halo of romance, and for a while his work enjoyed a vogue it is difficult now to explain. He had imagination, but no gift of clothing his imaginings in any glory of language. Yet his drama *Saul* won the admiration of Nathaniel Hawthorne, and was eulogized into passing fame. Since his death in 1869, however, he has fallen from his high estate, and languishes, not undeservedly, among the remembered who are no longer read.

Isabella Crawford (1850-86), who was not so happy in receiving recognition while she lived, was a lyrist of real charm and more than a touch of genius. She had gone to Canada with her family when she was a child, and, though born in Dublin, put into her work an essentially Canadian atmosphere and feeling. Her one book, *Old Spookses' Pass, Malcom's Katie, and Other Poems*, was published two years before she died, and there is enough of promise in it to convince one that Canadian poetry is the poorer by her death at thirty-six. Her lyrics have spontaneity and grace; her descriptions, such as this from *Malcom's Katie*, are alive with a sense of drama and sensitively imaginative both in vision and utterance:

> At morn the sharp breath of the night arose
> From the wide prairies in deep-struggling seas,
> In rolling breakers bursting to the sky,
> In tumbling surfs, all yellowed faintly through
> With the low sun; in mad, conflicting crests
> Voiced with low thunder from the hairy throats
> Of the mist-buried herds. . . .
> The late, last thunders of the summer crashed
> Where shrieked great eagles, lords of naked cliffs;
> The pulseless forest, locked and interlocked
> So closely, bough with bough, and leaf with leaf,
> So surfeit with its wealth that, while from high
> The moons of summer kissed its green-glossed locks
> And round its knees the merry west wind danced,
> And round its ring-compacted emerald
> The south wind crept in mocassins of flame,
> And the red fingers of the impatient sun
> Plucked at its outmost fringes—its dim veins
> Beat with no life, its deep and dusky heart
> In a deep trance of shadow, felt no throb
> To answer such soft wooing. . . .

Sangster, who died in 1893, and Lampman (1861-99) are of the Wordsworth school, with the master's love of nature, but without his profound philosophy. Lampman, indeed, in some of the sonnets and lyrics of *Among the Millet* (1888) and *Lyrics of Earth* (1895) has the true Wordsworthian felicity of description, but was less a thinker than an observer, with a delicate art in rendering minutely detailed word-etchings of natural scenery. He has been claimed as the authentically representative Canadian poet; but no one poet is that. Like Drummond and Pauline Johnson, in their widely differing fashions, he represents only certain phases in the life of Canada.

William Henry Drummond (1859-1907) is the undisputed laureate of the French-Canadians, in spite of the fact that by birth he was Irish. Brought up in Canada from the age of ten, he studied medicine, and as a hard-working doctor, a man of genial, kindly, lovable individuality, lived and laboured in a village of mixed English and French-Canadians. Something in the French-Canadian character appealed to him with a peculiar fascination, and prompted him to be its faithful and most notable interpreter. In *The Habitant, and Other French-Canadian Poems* (1898), and three later volumes, he gathered up his experiences and pictured the lives of the people he had made his own in ballads of quiet humour and pathos, whose texture and style are racy of the soil. They are little homespun comedies and tragedies written in the quaint *patois* of the habitant, and reveal with an intimate sympathy the tenderness, hardness, odd simplicity, superstition, sense of fun, and wistful ideality of those sturdy descendants of the old French colonists, whose idiosyncrasies have not been smoothed away by contact with the dominant race.

It is another and older side of Canada's complex individuality that is represented by Pauline Johnson (Tekahionwake). Her mother was English, but her father, G. H. M. Johnson (Onwanononsyshon) was of the blood royal of the Mohawk tribe, head chief of the Six Nations Indians, a scion of one of the fifty noble families of the federation founded over four centuries ago by Hiawatha. This federation was renamed, by early explorers, the Iroquois, and for their loyalty to the British Crown in the long fighting with the French were granted the lands bordering the Grand River, in Brant, Ontario, and in this reserve, on her father's estate, Pauline Johnson was born.

> Copper-tinted face, and smouldering fire
> Of wilder life were left me by my sire,
> To be my proudest claim;

and she inherited, too, for it breathes through her finest poems, that loyalty of her red ancestors to the British flag. She was proud to the last of her Mohawk blood, and the collected edition of her poems, issued by her friends when she lay dying in 1912, was named *Flint and Feather* after her tribe's weapons of war. Fire and passion are in her verse,

especially in her ballads of the stirring days when the Indian braves still took the warpath. But from the fierce, grim tragedy of *Ojison* or *As Red Men Die*, she could turn with equal cunning to the pathos and gentleness of *Workworn* or *My English Letter*; to the Whistler-like impressionism of *Joe*, *Marshlands*, *Under Canvas*, to the trumpet-note of patriotic pride in *Canadian-born* and *The Riders of the Plains*.

The verse of Wilfred Campbell (1861-1918) has culture and distinction. He believed that "the life of the canoe and the wilds is long past, and as alien from the great modern life of cultured Canada as it is from the civilization of London," and in the main, while lumbermen, ranchers, cow-punchers were still common objects of the wilds about him, and the Klondyke had scarcely recovered from its gold-fever, his poetry reflected that scholarly attitude of mind. His dramas have moments of passion and imaginative glow; his odes march to a stately music; and nobody has given us richer or more burningly emotional patriotic lines than are in some of his sonnets, and in his *Sagas of Vaster Britain*. Born in Western Ontario, he became, like his father, an Anglican clergyman, but withdrew from that order to hold a Government appointment as Bibliographer of the Archives of Canada.

Other poets who deserve more than passing mention are Arthur Stringer, Frederick George Scott, Agnes Machar, and Robert J. C. Stead, who with *The Homesteaders*, *The Cow-Puncher*, and *Denison Grant* is proving himself one of the ablest of Canada's younger novelists; but chief of her living poets are Charles G. D. Roberts and Robert W. Service.

Service, born at Preston, Lancashire (1872), was a bank clerk in Glasgow before, at twenty-one, he crossed the sea and lived as best he could in the Wild West of Canada to be sent presently to manage a branch bank at Yukon in the lawless, whirling years of the gold rush. Later he drew on what he had seen and known of those times for the vigorous, forcefully dramatic ballads in *Songs of a Sourdough* (1907); *Ballads of a Cheechako*; *Rhymes of a Rolling Stone* (1913); *Ballads of a Bohemian* (1920); and other of the books that have earned for him the title of "the Canadian Kipling." His prose works include *The Trail of '98* (1910); *The Poisoned Paradise* (1902); *The Roughneck* (1923). During the Great War he served in France with the Red Cross, and *Rhymes of a Red Cross Man* rank him with Roberts, who was a major in the Canadian Force, with F. G. Scott who was one of its chaplains, and with Colonel John M'Crae (*In Flanders Fields*) as the most memorable of Canada's war poets.

Service's popularity is unrivalled, but the premier place among Canadian poets belongs unquestionably to Bliss Carman. Born in New Brunswick (1861), he made his home in Connecticut, and gave to American journalism the high gifts that were meant for poetry. He died in 1929. Carman was not a great poet in the full meaning of the word, but he was a great singer. His verse carries no weight of thought; it is purely lyrical, and its magic lies in its perfect air of unpremeditation, in a flowing, careless simplicity of language that is quick with emotion. He published a score of volumes after *Low Tide on Grand Pré* (1893), and there are gracious, beautiful things scattered through his pages that have not been surpassed by any living English lyrist anywhere.

Charles G. D. Roberts (born New Brunswick, 1860) has made admirable contributions to Canadian history, but is rightly better known as a poet of wider range and greater power than Carman, and best known as the writer of *Kindred of the Wild*, *Hoof and Claw*, and a long series of such-like brilliantly imaginative stories of animal and bird life, while his vividly realized tales of men and women and life in the backwoods have given him a place in the front rank of Canadian novelists. Among his very numerous works are (verse) *Orion and Other Poems* (1880); *New Poems* (1919); *The Vagrant of Time* (1927); (prose) *Around the Camp Fire* (1896); *The Kindred of the Wild* (1902); *In the Morning of Time* (1919); and *Lovers in Acadie* (1924).

In the fine art of dramatizing natural history, however, Ernest Thompson Seton stands supreme. A Durham man by birth (1860), but Canadian by early adoption, he has for many years been naturalist to the Government of Manitoba, and his *Wild Animals I have Known*, *Biography of a Grizzly*, *Lives of the Hunted*, and a score of other volumes, for their studies in animal psychology, the subtle skill with which they weave into story the instincts, habits, and whole way of life of the furred and feathered creatures of the woods and fields, are unique in English letters.

The catalogue of Canadian fiction that matters begins with John Richardson's *Wacousta* (1832), which no longer matters much. More

notable is William Kirby's *The Golden Dog* (1887), an historical romance of eighteenth-century Quebec. And the foremost novelists of recent years include Sara Jeanette Duncan (Mrs. Coates) who, born at Ontario, married an Anglo-Indian journalist, and has produced a masterly succession of novels of Canadian and of Anglo-Indian life; Theodore Goodridge Roberts, brother of the poet (*Forest Fugitives, Love on Smoky River*, etc.); Ralph Connor (Charles William Gordon), also born in Ontario, a Presbyterian minister at Winnipeg, whose novels of Western Canada, beginning with *Black Rock* and *The Sky Pilot*, have made him far the most popular of all Canada's novelists throughout the English-speaking world.

Almost as popular, and more individual in kind, is the work of Stephen Butler Leacock. He was born in England (1869), went to Canada early enough to go to school there, has been a professor of political economy at M'Gill University, Montreal, for many years, and has published two very able books on that subject. But he has a place of his own in Canadian literature as a brilliant, witty parodist in prose (*Nonsense Novels*, etc.); as a writer of whimsical essays on things literary and general (*Literary Lapses*); of farcical tales that riotously satirize the ways and manners of modern society (*Behind the Beyond, Arcadian Adventures of the Idle Rich*, etc.); and of at least one volume of delightfully humorous stories of real life and character in Canada (*Sunshine Sketches of a Little Town*), which is also one of the best and most charming things in latter-day fiction.

Sir Gilbert Parker (1862-1932) was Canadian by birth, and though he was long resident in England, and an English member of Parliament, his work belongs to the literature of Canada by virtue of such brilliant stories of the life and character of his native land as *Pierre and his People, The Trail of the Sword*, and, to say nothing of others, *When Valmond came to Pontiac*. Another distinguished novelist who, born at Montreal, has since settled in England is Lily Dougall (*Beggars All, What Necessity Knows*, etc.); and Grant Allen is frequently listed as a Canadian scientist and novelist, but, born at Kingston, Canada (1848), he did all his literary work after he had migrated to England, where he died in 1889.

Prominent among many capable writers on national and constitutional history and parliamentary government are Sir George Bourinot (born Nova Scotia, 1837); William Kingsford (1819-98), a Londoner by birth, who went to Canada as a soldier, remained there after his discharge, and wrote a heavy but reliable *History of Canada* in ten volumes; and Goldwin Smith (1824-1910) who, born at Reading, having made a reputation in England as politician and professor of history at Oxford, spent the last forty years of his life in Canada, and became one of her leading journalists, and author of divers admirable histories and political biographies.

South African Literature.—The first appearance of South Africa in the general literature of the world was in 1572, when Camoens published the *Lusiad*, the national epic of Portugal. In that poem the majestic spirit of the Cape of Storms rises from the waves to confront and threaten the European explorers of the southern seas, and both the striking character of the image and the magnificence of the verse soon made this the most famous passage of a famous poem.

It was the travellers, however, not the poets, who were to give South African literature its distinctive character. Many of the early Portuguese, Dutch, and English explorers wrote stirring accounts of their adventures at the Cape or Mozambique, and several of these narratives have been published. Some are in Hakluyt; others, such as the *Voyage to East India* (1655) by Edward Terry, are scattered through the general literature of the seventeenth and eighteenth centuries. But, as the title of Terry's book indicates, South Africa was not the main interest of these works. Terry was chaplain to Sir Thomas Roe on his embassy to the court of the Great Mogul, and to him, as to other travellers, the Cape was as yet merely a port of call on the way to the Orient.

Most of these half-forgotten adventurers belong to history rather than literature; but there is one name of greater fame in the list. In his *Voyage à l'Ile de France* (1773) Bernardin de Saint-Pierre describes the pleasant easy life at the Cape, where the excellent Dutch burghers seemed to him to have no other occupation but eating from morning till night. But the classic tale of *Paul et Virginie*, which has immortalized this journey of Saint-Pierre, finds its scene in Mauritius and not on the mainland of South Africa.

South African literature really begins with the British occupation of the Cape. The Dutch settlers were men of one book—the Bible; and despite the historical interest of

Van Riebeeck's seventeenth-century journal, they were traders and farmers, not writers. Experience has shown, too, that their language, the *Taal*, although a soft and easy variety of Dutch, is too poor in abstract terms and too limited in its general vocabulary to be a satisfactory medium for composition. For that reason alone, and apart from the wide audience which periodicals and books published in English can obtain, the dominant literary language of South Africa has been English.

But when Barrow, the first of the great travel-writers, arrived in 1797, there was no printing press at Cape Town, except a small machine for printing cards and handbills. The first newspaper—the *South African Commercial Advertiser*—was not published until 1824, under the editorship of Thomas Pringle; but after eighteen numbers had been issued, it was suppressed for criticizing the Government.

There are two sides to that story, which is too long to tell here; but Pringle (1789-1834), as author more than editor, is the first considerable name in South African literature. A weakly Scottish child who was educated at Kelso and Edinburgh University, his thoughts early turned to writing; no doubt he was influenced by his acquaintance with Sir Walter Scott who, however, characterized him rather contemptuously as "a worthy creature, but conceited."

On his way out to South Africa in 1820 he wrote *The Emigrant's Farewell*, a poignant little poem whose simple pathos moves every reader; and in spite of his excellent prose *Narrative of a Residence in South Africa* (1835), it is as a poet that he is best remembered. His *African Sketches*, the *Sonnets* and *Ballads*, and the *Bechuana Boy* are still of interest; but although Coleridge declared that *Afar in the Desert* was among the two or three most perfect lyric poems in the language, less partial critics have thought the praise absurdly extravagant, and Pringle is seldom found in the anthologies. He can only hold a minor place in the ranks of second-class English poetry, and both his narrative style and the technical character of his versification show him to belong to the eighteenth-century school, which Coleridge himself and his fellow Lake poets had already superseded. One of his couplets which has been admired sufficiently proves this:

> And the mighty rhinoceros wallows at will
> In the fen where the wild ass is drinking its fill.

Pringle had many successors; as early as 1830 the editor of the *Cape of Good Hope Literary Gazette* complains that he has enough poetry to build a wall round Parnassus. But South African verse has excelled in quantity rather than quality; and apart from Scully's *Namaqualand* and John Runcie's songs, there is little of outstanding merit, certainly nothing to equal the Australian school of poetry. One of Runcie's verses may be quoted to show the average level:

> By narrow laws we judge the farmer people
> Whose larger outlook we would fain gainsay,
> Even as we fain would coop beneath a steeple
> The God to whom we pray.

Scully perhaps attains a higher note in *Namaqualand*:

> A land of deathful sleep, where fitful dreams
> Of hurrying spring scarce wake swift fading flowers.
> . . . . . .
> The waves for ever roar a song of death,
> The shore they roar to is for ever dead.

Mention should also be made of Ian D. Colvin's *Parliament of Beasts*, a brilliant political satire in the style of Churchill. But the great South African poet has yet to be born.

If the country has produced little in the way of poetry, its literature of travel is unsurpassed; not even tropical America or Australia can equal it. South Africa has indeed been peculiarly fortunate in its explorers and settlers, and a whole succession of great names in this important field of letters crowds the whole nineteenth century.

Barrow and Burchell are the first South African travellers whose records hold a permanent place in literature. Samuel Daniell, whose celebrated aquatints make *African Scenery and Animals* a collector's treasure, belongs rather to art than literature; but Burchell is quickly followed by Robert Moffat, who with his wife spent many years as a missionary among the Bechuana, and later the Matabili; the two volumes of *Journals* and *Scenes and Labour in South Africa* (together with the *Lives of Robert and Mary Moffat*) form a fitting introduction to the classic books of Livingstone, *Journeys in South Africa*, *The Zambesi and its Tributaries*, and the *Last Journals*.

The first of these has been through innumerable editions, and is one of the most popular books in the world, but the two later books are equally interesting as the shrewd but kindly observations of a man who was at once missionary, explorer, geographer, naturalist, and statesman—an extraordinary combination which makes Livingstone unique among writers of travel. His style—simple,

concise, clear, and dignified—is admirably suited to his purpose; and despite the proverb about travellers' tales, it may be added that every subsequent explorer who has followed in his steps has confirmed his amazing accuracy in almost every matter, large and small.

Livingstone is the standard writer of South African travel, but many others rank only second to him. Galton's *South Africa*, dealing with Damaraland, has kept its popularity for sixty years; Mackenzie—who, like Moffat and Livingstone, was a missionary—is still remembered for the admirable *Ten Years North of the Orange River*; and three works by F. C. Selous, the great hunter, give a graphic picture of the interior. *A Hunter's Wanderings*, and *Travel and Adventure in South-East Africa*, describe the days before white settlement; *Sunshine and Storm in Rhodesia* is a first-hand account of the pioneers whom Selous led from Mafeking to the site of Salisbury.

One of these pioneers has also written a lively chronicle of those early days in Rhodesia that at once attained popularity: *The Northward Trek*, by S. Portal Hyatt, and the same author's *Off the Main Track* have the real breath of adventure. Another little book, Boggie's *From Ox-waggon to Railway* (1897), possesses typographical rather than literary interest; it was the first book printed at Bulawayo, whose earliest newspapers, a year or so before, were issued in typescript, or even lithographed handwriting.

Hamilton Browne's *Lost Legionary n South Africa* is another vivacious chronicle; these open-air books, written by men who handled a pen as easily as a gun, are likely to be read when the more formal volumes of travels, such as Trollope's *South Africa* and Bryce's *Impressions*, are forgotten, or consulted only by historians anxious to verify some detail of the past.

When we turn from travel to other branches of literature, however, the record again sinks from the acknowledged classic to the mere level of respectable provincial merit. It is a singular and perhaps ironic curiosity of ecclesiastical geography, but nothing more, that Bishop Colenso's critical works on the Pentateuch and other theological subjects, which made so great a noise in Victorian England, were written in South Africa, where he was for some years Bishop of Natal until deposed. The country has produced many historians of whom two, the Rev. H. C. V. Leibbrandt (keeper of the archives at Cape Town) and Dr. Theal, whose voluminous publications fill a large shelf, have more than local fame. But although South African history has been written on the great scale, it has scarcely been written in the great manner.

There have been several South African novelists, and more novels dealing with the country, such as Anthony Hope's *God in the Car*, a thinly disguised portrait of Cecil Rhodes. Of these Rider Haggard's romances are by far the most popular: *King Solomon's Mines*, *She*, and the Quatermain books are familiar all over the world. *The Shulamite*, by Alice and Claud Askew, is a novel of South Africa of which it has been said that it only misses greatness by a hairbreadth; it has perhaps hardly had justice done it, but its reputation is likely to grow. The third, and greatest writer of fiction is the only one on our list who is a South African born.

Olive Schreiner, the daughter of a German missionary in Basutoland came of a family which has played a distinguished part in South Africa Her *Story of an African Farm*, written when still a girl, was immediately acclaimed by George Meredith, the acting as reader to the English publishing house which received the manuscript, as a masterpiece. The world has endorsed his verdict; its success was immediate, and it has been lasting. It has now taken its place among the recognized classics of the world's fiction.

Her later books, *Dreams*, *Dream Life and Real Life*, and *Trooper Peter Halkett of Mashonaland* (this last largely an attack on British settlers in Mashonaland), hardly fulfilled the promise of the first. They are well above the average, but they leave the reader with the sense that the writer has not done full justice to her powers. Her last publication (1911) *Women and Labour*, was a mere fragment of a larger work which was unfortunately burnt. It indicates that the author's interest had become absorbed in the woman's movement of the time; it has a place in the literature of feminism, hardly in that of South Africa. Possibly she would have returned to her first and greatest inspiration, but unfortunately Olive Schreiner (who had become Mrs. S. C. Cronwright) died in early middle age in December, 1920. Her place in the world's literature is secure held, in virtue of her one great book but her too short life leaves one with the feeling of a promise not quite fulfilled.

COLON'NA. An Italian family that had become important as early

as the eighth century. Its fame during the Middle Ages eclipsed that of every other Roman family except the great rival House of the Orsini. The Colonna family is at present represented by several branches, the Colonna-Sciarra, Colonna-Stigliano, etc. It played an important part in the affairs of Europe, became allied to the greatest Houses of Italy, Spain, and Germany, and has furnished many celebrated warriors, Popes, and cardinals.

COLON'NA, Cape (ancient **Sunium**). The southern extremity of Attica, Greece. Its summit is crowned by the ruins of a temple of Athena 269 feet above the sea, of which sixteen columns of white marble are still standing.

COLON'NA, Vittoria. The most renowned poetess of Italy, was the daughter of Fabrizio Colonna, high-constable of Naples, and born in 1490. At the age of seventeen she was married to Ferdinand, Marquis de Pescara, the companion of her youth, who became one of the distinguished men of his age. They lived in the happiest union, and when her husband died of wounds received at the battle of Pavia (1525), Vittoria sought consolation in solitude and in poetry. All her poems were devoted to the memory of her husband. In 1539 she returned to Rome, where she became the object of a passionate friendship on the part of Michel Angelo, who addressed some of his finest sonnets to her. She died at Rome in 1547. Her most celebrated work is the *Rime Spirituali*, 1538. They are considered among the happiest imitations of Petrarch.

COLONNADE'. In architecture, any series or range of columns placed at certain intervals from each other. When surrounding the building on the exterior, the colonnade is called a *peristyle*; when projecting beyond the line of the building, it is called a *portico*.

COL'ONSAY and OR'ONSAY. Two islands off the west coast of Argyll, Scotland, united at low-water, and at high-water only about 100 yards apart; united length, about 12 miles; breadth, varying from 1 to 3 miles. The inhabitants are engaged in fishing and rearing cattle and sheep. Pop. (1931), 238.

COL'ONY. A settlement founded in some foreign country which thereby comes under the sovereignty of the land from which the settlers came. Originally the name was applied to a settlement in a conquered country, and in modern times it is frequently used for a district of a large city which is inhabited by subjects of some foreign nation (Italian colony, French colony, etc.). Generally speaking, the colonies of any particular country are taken to be all that country's foreign possessions. Colonies may either be formed in dependence on the mother-country or in independence. In the latter case the name of colony is retained only in an historical sense, if, indeed, it is retained at all.

Ancient Colonists.—The motives which lead to the formation of colonies, and the manner of their formation, are various. Sometimes the ambition of extending territory and the desire of increasing wealth have been the chief impulses in colonization; sometimes they have been founded by discontented subjects; sometimes they have originated in the necessity for finding an outlet for the surplus population of European states.

Among ancient nations the principal promoters of colonization were the Phœnicians, the Greeks, and the Romans; the greatest colonizers in modern times have been the English and the Spaniards, next to whom may be reckoned the Portuguese, the Dutch, and the French. German attempts at colonizing were never successful, their lack of success culminating in Germany's complete loss of her colonies at the end of the European War.

The Phœnician colonies were partly caused by political dissensions and redundant population, but were chiefly commercial, serving as entrepôts and ports of repair for Phœnician commerce along the coasts of Africa and Spain, in the latter of which they numbered, according to Strabo, more than two hundred. But it was in Africa that the most famous arose, Carthage, the greatest colonizing state of the ancient world.

The Greek colonies were widely spread in Asia Minor and the islands of the Mediterranean, the coasts of Macedonia and Thrace, in South Italy and Sicily. The colonies of the Greek and Phœnician cities had no political connection with the mother-city, except where commerce was the main incentive to foundation. Athens was the first city to adopt complete control of her outlying possessions, and the settlements which she planted in dependent territories were colonies in the real sense of the word.

The colonies of Rome were chiefly military, and while the empire lasted were all in strict subordination to the central government. As the Roman power declined the remains of them amalgamated with the peoples among whom they were placed, thus form-

ing in countries where they were sufficiently strong what are known as the Latin races, with languages (Spanish Portuguese, French, and Italian) which are merely modifications of the old Roman tongue.

Before America and the way by sea to the East Indies were discovered, the only colonies belonging to European states were those of the Genoese, Pisans, and Venetians in the Levant and the Black Sea, flourishing establishments on which the mercantile greatness of Italy in those days was largely built.

The **Portuguese** were the first great colonizers among modern states. In 1419 they discovered Madeira, the Azores, and the Cape Verde Islands; the Congo and the Cape of Good Hope followed; and before the century was out Vasco de Gama had landed at Calicut on the Malabar coast of India. The first Portuguese colonies were garrisons along the coasts where they traded: Mozambique and Sofala on the east coast of Africa, Ormuz and Muscat in the Persian Gulf, Goa and Damao on the west coast of India. Colonies were established in Ceylon in 1505, in the Moluccas in 1510. Brazil was discovered in 1499, and this magnificent possession fell to Portugal, and was colonized about 1530.

Bad government at home and the subjection of the country to Spain caused the loss of most of the Portuguese colonies. The Portuguese colonies have now an area of 800,400 sq. miles, and comprise Goa, Diu, and Damao in India; Macao in China; Timor in the Malay Archipelago; and Portuguese Guinea, Angola, Portuguese East Africa, Principe, São Thomé, and the Cape Verde and other islands in Africa.

Spain.—Soon after the Portuguese the *Spaniards* commenced the work of colonization. In 1492 Columbus, on board of a Spanish vessel, discovered the Island of San Salvador. Haiti, or San Domingo, Porto Rico, Jamaica, and Cuba were soon colonized, and before the middle of the sixteenth century Mexico, Ecuador, Venezuela, New Granada, Peru, and Chile were subdued, and Spain took the first rank amongst the colonizing powers of Europe. But the Spaniards never really attempted to develop the industrial resources of the subject countries. The pursuit of mining for gold or silver occupied the colonists almost exclusively, and the enslaved natives were driven to work themselves to death in the mines. Cities were founded, at first along the coasts, for the sake of commerce and as military posts; afterwards also in the interior, in particular in the vicinity of the mines, as Vera Cruz, Cumana, Porto Bello, Carthagena, Valencia, Caracas; Acapulco and Panama, on the coast of the Pacific; Lima, Concepcion, and Buenos Aires.

The colonial intercourse with Spain was confined to the single port of Seville, afterwards to that of Cadiz, from which two squadrons started annually—the *galleons*, about twelve in number, for Porto Bello; and the fleet, of fifteen large vessels, for Vera Cruz. When the power of Spain declined, the colonies declared their independence, and thus were formed the Republics of Mexico, Venezuela, Colombia, Ecuador, Peru, Bolivia, Chile, etc. Cuba, Porto Rico, and the Philippine Islands passed to the United States in 1898; the Caroline Islands, etc., were sold to Germany in 1899; and now the colonial possessions of Spain are all in Africa and comprise Spanish Guinea (Rio Muni, Fernando Po, Annobon, etc.), Rio de Oro, and part of Morocco, amounting in area to 129,470 sq. miles.

Holland.—The hatred of Philip II, who prohibited Dutch vessels from the port of Lisbon, forced the *Dutch* to import directly from India or lose the large carrying trade they had acquired. Several companies were soon formed, and in 1602 they were united into one, the Dutch East India Company, with a monopoly of the East India trade and sovereign powers over all conquests and colonies in India. The Dutch now rapidly deprived the Portuguese of nearly all their East Indian territories, settled a colony at the Cape of Good Hope (1650), established a West India Company, made extensive conquests in Brazil (1623-60), which were soon lost, and more permanent ones on some of the smaller West India Islands, as San Eustatia, Curaçoa, Saba, etc.

The growing power of the British and the loss of Holland's independence during the Napoleonic wars were heavy blows to the colonial power of the nation. But the Dutch still possess numerous colonies in the East Indies, among which the more important are Java, Sumatra, Dutch Borneo, the Molucca Islands, and part of New Guinea, also several small islands in the West Indies, and Surinam or Dutch Guiana. The total area of the colonial possessions of the Netherlands is 788,336 sq. miles.

France was somewhat late in establishing colonies. Between 1627 and 1636 the West Indian islands of St. Christopher's, Guadeloupe, and Martinique were colonized by private persons. Champlain was the pioneer of the French in the exploration of the North American continent, and

founded Quebec in 1608. Colbert purchased several West Indian islands, as Martinique, Guadeloupe, St. Lucia, etc., and sent out colonists in 1664 to Cayenne. In 1670 the East India Company formed by Colbert founded Pondicherry, which became the capital of extensive possessions in the East Indies.

At the beginning of the eighteenth century France had extensive settlements in Canada, Nova Scotia, and Newfoundland, the most flourishing of the West Indian Islands, and she seemed to have a prosperous career before her in India. Ere long, however, the rival interests of British and French colonists brought about a conflict which terminated in the loss of Canada and other North American possessions, as well as many of the West Indian Islands, while the dominion of India passed into the hands of the British.

The chief colonial possessions of France at present are: in India, Pondicherry, and a few other small territories; French Indo-China, i.e. Cochin-China, Laos, Tongking, and the protectorates of Annam and Cambodia in South-Eastern Asia; New Caledonia, the Society, the Loyalty, and the Marquesas Islands, etc., in Oceania; in Africa, Algeria, Tunis, Senegambia, Sahara, French West Africa, French Equatorial Africa, French Somaliland, Réunion, Madagascar, etc.; in America, Martinique, Guadeloupe, St. Barholomew, and Guiana. Algeria is now officially a French department. The total area of French colonial possessions is 5,383,035 sq. miles.

Denmark's northern dependency, Greenland, though of considerable extent, is of small value. Iceland is not a Danish colony, but an independent kingdom, united to Denmark only in the person of the king. The Danish West Indies were sold to the United States in 1917.

Italy has the colony of Eritrea between Abyssinia and the Red Sea, Italian Somaliland, and Tripoli and Cyrenaica (Libya Italiana).

Belgium possesses the Belgian Congo.

To the **U.S.A.** belong the Virgin Islands, the Samoan Islands, Guam, and the Philippines.

The efforts of **Germany** at colonization were never successful, and at the conclusion of the European War she was deprived of all her colonies, which, along with certain Turkish territories, were delivered under mandates from the League of Nations to various Allied Powers: Britain to 'Iraq (since 1927 an independent Kingdom), Palestine, Trans-Jordania, New Guinea, Samoa (W.), Nauru, South-West Africa, and parts of Togo and Cameroon; France was given Syria and Lebanon, and the rest of Togo and Cameroon; while Japan was appointed mandatory of certain Pacific islands.

Great Britain is undoubtedly the greatest colonizing power that ever existed. In 1591 English ships reached the East Indies by the Cape route, and in 1600 the East India Company was founded. For more than a century Britain had comparatively small interest in India, but in 1707 commenced the struggle with the French which practically ended with Clive's victory at Plassey in 1757. A century later nearly the whole of India was under the government of the Company, but after the Mutiny it was transferred to the Crown.

In America, Virginia was colonized in 1607, and New England by the Pilgrim Fathers in 1620. The colonization of New Hampshire, Maine, New Jersey, Connecticut, and Rhode Island soon followed, and in 1664 the Dutch were driven from what is now New York. Pennsylvania was settled by Quakers in 1682, Maryland in 1631, Carolina in 1670, and Georgia in 1732. Colonies were already established in Bermuda and in many of the West Indies, and Newfoundland (annexed in 1583) was settled in 1621 and 1633. Canada (q.v.) was surrendered to Britain in 1763. (For history of American Colonies, *see* UNITED STATES.)

Australia was discovered in the beginning of the seventeenth century, and New South Wales was established as a penal settlement in 1788; Tasmania followed in 1803; Western Australia (at first a penal settlement) became a free colony in 1829; Victoria was colonized in 1835, and became independent in 1851; and South Australia was settled in 1836. Queensland became a separate colony in 1859, and New Zealand was settled in 1839 and made a colony in 1840. The annexation of the Fiji Islands took place in 1874, and of part of New Guinea in 1884.

In South Africa, Cape Colony, first settled by the Dutch in 1652, became a British colony in 1815. Natal followed in 1843, Bechuanaland in 1885, Zululand in 1887, Rhodesia in 1888-89, and Orange Free State and Transvaal in 1900. In West Africa the first station on the Gold Coast was founded in 1618, and Gold Coast, Gambia, and Sierra Leone are all ancient possessions of the British Crown. Lagos and Nigeria have been acquired since 1885. Other notable African colonies are Kenya, Uganda, and Somaliland.

Gibraltar was conquered in 1704, Malta in 1800, Cyprus, after having been administered by Britain since 1878, was annexed in 1914, and Hong Kong was ceded in 1860. The total area of the British colonies is estimated at 12,279,277 sq. miles, while mandated territories have an additional area of *c.* 983,762 sq. miles. According to their governmental relations with the Crown, the overseas territories of the British Empire may for convenience be arranged under several heads.

The self-governing **Dominions** of the British Empire are independent states coequal within the Empire with the United Kingdom. This complete independence and autonomy was put in legal form by the Statute of Westminster which was passed by the Parliament of the United Kingdom in 1931. The Dominions are Canada, Australia, New Zealand, South Africa, Newfoundland, and the Irish Free State. They are all members of the League of Nations.

The other overseas territories of the British Empire may be arranged under several heads, according to their relations with the Crown: (1) **India** (q.v.), which, being destined to become a dominion, already has certain dominion privileges. The British Government, however, retain direct control of the executive, and the Viceroy has certain powers regarding essential legislation. (2) **Colonies possessing responsible government** (Malta and Rhodesia). In these the British Government has only a veto on legislation and controls no official but the Governor. (3) **Colonies possessing representative government** (Bermuda, Bahamas, etc.). In these the Crown has more power over legislation and retains control of the public offices. (4) **Crown Colonies**, in which the legislature is controlled by an executive containing a majority of Crown officials. This is necessary where there is a large native population unfit for political activity. Official representation is decreased as the political education of the natives progresses. (5) **Protectorates**, such as Somaliland, which differ from Crown colonies in that the inhabitants are not British subjects, and that the territory does not belong to the Crown. *See* PROTECTORATE. (6) **Protected States** (Sarawak), which preserve their legal identity, British officials acting in the name of the rulers of the various countries. (7) **Mandated Territories**, that is, former German colonies held by Britain under League of Nations mandate. Britain has complete control, but is answerable to the League of Nations. (8) **Spheres of Influence.** *See* PROTECTORATES.

The British colonies are administered by the Secretary of State for the Colonies, who is in charge of the Colonial Office with its various departments, the chief of which are the West Indian Department, the Far Eastern Department, the Ceylon and Mauritius Department, the Gold Coast and Mediterranean Department, the Nigeria Department, the East Africa Department, the Tanganyika and Somaliland Department, the Middle East Department, and the General Department. In 1925, a new Secretaryship of State for Dominion Affairs was created, and as a result the Dominions Office was set up, to take over, from the Colonial Office, business connected with the Self-governing Dominions. *See* IMPERIAL CONFERENCE.—BIBLIOGRAPHY: *The Colonial Office List*; A. W. Jose, *The Growth of the Empire*; P. S. Reinsch, *Colonial Administration.*

COL'OPHON. An ancient Ionian (Greek) city of Asia Minor, about 8 miles N. of Ephesus, one of the places that claimed to be the birthplace of Homer, and the native city of Mimnermus, the elegiac poet, and of other eminent men.

COL'OPHON. The device or imprint at the end of a published work, which in old books frequently stated the name of the author as well as the printer's name, along with the date and place of publication, most of which information is now given on the title-page.

COLORADO (kol-o-rä'dō). One of the United States of America, situated in the central belt of states in the Rocky Mountains, between lat. 37° and 41° N., and long. 102° and 109° W., and containing an area of 103,948 sq. miles. The western and central portions of its area are occupied by an intricate plexus of wild and irregular ranges enclosing valleys known as "parks," most of which are fertile, well wooded, and of a mild climate. These parks are apparently the basins of former lakes upheaved and deprived of their waters by volcanic agency, with their original shape and situation at the foot of high mountains undisturbed, while their lowest depths are from 6000 to 9000 feet above the level of the sea.

A large number of the mountains are over 14,000 feet high, including Pike's Peak, Long's Peak, and others. The east of the state is a vast plain well adapted for pasture. The rivers include the Arkansas, South Platte, Grand River, etc.,

many of them remarkable for the grandeur of their cañons.

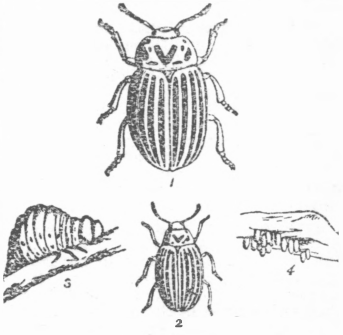
Among wild animals are the grizzly, the black and brown bear, prairie-wolf, buffalo, several kinds of deer and big-horn sheep. There are extensive forests. Of the arable lands in the state a great portion require irrigation. Grasshoppers sometimes commit great ravages. The climate is dry and healthy.

The chief wealth of Colorado consists of its minerals, principally gold and silver. Copper, lead, zinc, graphite, tungsten, and petroleum are also mined in large quantities. There are large works for smelting and refining metals. Iron is widely diffused, and coal is mined to the extent of 9,000,000 tons a year. There were in 1931 5489 miles of railways, 227 of which are electrified. The public school system is good, and there are two universities.

Colorado was little known previous to 1859; it was organized as a territory in 1861, and admitted as a state in 1876. The state capital is Denver, which in 1870 had a pop. of 4759, and in 1923, 287,861. Pueblo is the next in importance, pop. 43,050. Pop. of the state in 1870, 39,864; in 1930, 799,024; in 1916, 962,060; census pop. in 1930, 1,035,791.—BIBLIOGRAPHY: H. H. Bancroft, *History of the Pacific States* (vol. xx.); F. Hall, *History of Colorado*; J. E. Snook, *Colorado History and Government*; E. Parsons, *Guide-book to Colorado*.

COLORADO. A name of two rivers of the United States.—1. The Western Colorado, or Rio Colorado, formed by the junction of the Green and Grand Rivers, at about lat. 38° N.; long. 110° W., in Utah. It flows south-west and south through Arizona, and between Arizona and Nevada and California, and, after a total course, including Green River, of about 2000 miles, falls into the Gulf of California. Among the most wonderful natural objects in North America is the Big Cañon of the Colorado, between long. 112° and 115° W. Here the river flows between walls of rock which are nearly vertical, and are in some places 6000 feet high. This cañon is more than 300 miles long. 2. A river in Texas which rises in the north-west part of the state, flows generally south-east, and, after a course of about 900 miles, falls into the Gulf of Mexico at the town of Matagordo.

COLORADO BEETLE. An American species of beetle (*Chrysomēla*, or *Polygramma*, or *Doryphŏra decemlineāta*), nearly half an inch in length, almost oval, of a yellowish colour marked with black spots and blotches, and on the elytra with ten black longitudinal stripes. The



1, 2, Colorado Beetle (*Doryphora decemlineāta*) magnified and natural size. 3, Caterpillar. 4, Eggs.

wings, which are folded under the elytra, are of a blood-red colour. It is a native of the eastern slopes of the Rocky Mountains, and works great havoc among the potato crops.

COLORADO SPRINGS. A city of the United States, Colorado, near the centre of the state, in a lofty situation, with fine mountain scenery adjacent, Pike's Peak rising above it. It is a railway centre and health-resort, the seat of Colorado College, has mineral springs, and there are gold and other mines in the neighbourhood. Pop. 33,237.

COLORIM'ETER. An instrument for measuring the depth of colour in a liquid by comparison with a standard liquid of the same tint.

COLOS'SÆ. An ancient city of Asia Minor, in Phrygia, on the Lycus, a branch of the Mæander. It was the seat of one of the early Churches of Asia to the members of which the Apostle Paul wrote about A.D. 62 or 63.

COLOSSE'UM, or COLISEUM. A name given to the Flavian Amphitheatre in Rome, a large edifice for gladiatorial shows, fights of wild beasts, and similar sports. It was begun by Vespasian A.D. 72, and finished by Titus A.D. 80. The outline of the Colosseum is elliptic, the exterior length of the building being 620, its breadth 525, and its height 157 feet; it is pierced with eighty openings or vomitoria in the ground story, over which are superimposed three other stories, the whole rising perpendicularly. The colosseum

could contain 45,000, or, according to some, 87,000 spectators. Although two-thirds of the original building have disappeared, it is still a wonderful structure.

COLOS'SIANS, Epistle to the. One of the four captivity epistles written to the Colossians by the Apostle Paul from Rome, at the same time that he wrote the epistles to the Ephesians, Philemon, and the Philippians. The epistle contains a summary of Christian doctrine, especially dwelling on the divine power and majesty of Christ, and a series of practical exhortations to specific duties of Christian morality.

COLOS'SUS. In sculpture, a statue of enormous magnitude. The Asiatics, the Egyptians, and in particular the Greeks, have excelled in these works. The most celebrated Egyptian colossus was the vocal statue of Memnon in the Plain of Thebes, supposed to be identical with the most northerly of two existing colossi (60 feet high) on the west bank of the Nile.

Among the colossi of Greece the most celebrated was the colossus of Rhodes, a brass statue of Apollo 70 cubits high, esteemed one of the wonders of the world, erected at the port of Rhodes by Chares, 290 or 288 B.C. It was thrown down by an earthquake about 224 B.C. The statue was in ruins for nearly nine centuries, when the Saracens, taking Rhodes, sold the metal, weighing 720,900 lb., to a Jew, about 653. There is no authority for the popularly received statement that it bestrode the harbour mouth, and that the Rhodian vessels could pass under its legs.

Among the colossi of Phidias were the *Olympian Zeus* and the *Athena* of the Parthenon; the former 60 feet high and the latter 40. The most famous of the Roman colossi were the *Jupiter* of the Capitol, the *Apollo* of the Palatine Library, and the statue of Nero, 110 or 120 feet high, from which the contiguous amphitheatre derived its name of Colosseum.

Among modern works of this nature is the colossus of San Carlo Borromeo, at Arona, in the Milanese territory, 60 feet in height; the *Bavaria* at Munich, 65 feet high; the statue of Hermann or Arminius near Detmold, erected in 1875, 90 feet in height to the point of the upraised sword, which itself is 24 feet in length, the height of the figure to the point of the helmet being 55 feet; the statue of *Germania*, erected in 1883 near Rüdesheim, a figure 34 feet high, placed on an elaborately sculptured pedestal over 81 feet high; the equestrian statue of Peter the Great in Leningrad; and Bartholdi's statue of *Liberty* presented to the United States by the French nation, and which measures 104 feet, or to the extremity of the torch in the hand of the figure, 138 feet. It is erected at New York harbour on a pedestal 114 feet high, is constructed for a lighthouse with one of the most powerful fixed lights in the world, and stands 317 feet above mean tide.

COLOS'TRUM, or BEESTINGS. The first milk of mammalia secreted after giving birth to young. It contains more than five times the albuminoid compounds found in average cows' milk; and it has a purgative action, and serves to clear the bowels of infants of the meconium or fæcal matter which they contain at birth.

COLOUR. The name given to distinguish the various sensations with which light of various rates of vibration affects the eye. By a transference of meaning not uncommon with the words for our sensations, the word *colour* is also used to denote the property of bodies that causes them to emit the light that thus affects our senses. The molecular constitution of a body determines the character and number of the light vibrations it reflects to the eye, and so gives to each body its own characteristic colour; hence the term colour is used to denote that in respect of which bodies differ from each other in appearance independently of their form.

Ordinary white light (the light which comes from an incandescent solid or liquid) when transmitted through triangular prisms of glass or other media spreads out into a coloured band or spectrum. We infer that ordinary light, the light which when it enters the eye produces the sensation of white light, is really compounded of light of many different colours. (*See* DISPERSION, SPECTRUM, and LIGHT.)

The colours thus shown are usually said to be seven—red, orange, yellow, green, blue, indigo, violet; although in reality there is an enormous, if not an infinite number of perfectly distinct colours in light. The seven colours are frequently called the primary colours, and other tints and shades are producible by mixing them; but in a stricter sense the primary colours are three in number, namely, red, green, and blue-violet. These three colours or kinds of light cannot be resolved into any others. On the other hand, when they are mixed in right proportions they produce white light. Farther, the com-

bination of any two gives the complementary colour to the third, e.g. red and light green when mixed produce yellow, which is complementary to blue-violet.

In the scientific sense of the word white and black are not considered colours, a white body reflecting and a black body absorbing all the rays of light without separating them, whereas the colours proper are due to separation of the rays of light by partial absorption and reflection or by refraction. If a body absorbs every other kind of light and reflects or transmits red light only, it will appear of a red colour; if it absorbs every kind except blue rays, it will appear blue; and so on. If more than one kind of light be transmitted or reflected, the object will appear of a colour compounded of these different rays of light.

In art the term colour is applied to that combination or modification of tints which produces a particular and desired effect in painting. The properties of the colours of the spectrum have to be distinguished from the properties of colours in the sense of *pigments*. The pigments red, blue, and yellow, regarded in the arts as the primary colours, produce effects, when mixed, very different from those produced by admixture of the corresponding spectrum colours. These three pigment colours form other colours thus: red and yellow make orange, yellow and blue make green, and red and blue make purple; but red, blue, and yellow cannot be produced by any combination of the other colours.

Various methods exist for the measurement and classification of colours. That of Sir William Abney consists in determining the relative proportions of the primaries which are contained in the colour under test. Besides this, which may be said to determine the *hue* or *tint*, the *purity* or freedom from white light, and *luminosity* of the colour require also to be specified.

The three-colour theory has important applications in the arts, namely in colour photography and in the photo-mechanical process of printing in three colours.—BIBLIOGRAPHY: Sir W. de W. Abney, *Colour Vision and Trichromatic Theory*; H. A. Rankin, *Lessons in Colour*; M. Luckiesh, *Colour and its Applications*; J. H. Parsons, *An Introduction to the Study of Colour Vision*; E. J. Taylor, *Colour Sense Training and Colour Using*.

COLOUR-BLINDNESS. Total or partial incapability of distinguishing colours. Colour-blindness has been divided into three grades: (*a*) inability to discern any colour, so that light and shade, or black and white, are the only variations perceived; (*b*) inability to distinguish the nicer shades of the more composite colours, as browns, greys, and neutral tints; (*c*) inability to distinguish between the primary colours, red, blue, and yellow, or between them and their secondaries, green, purple, orange, and brown. Red is the colour which the colour-blind are most commonly unable to distinguish, while yellow is the most easily recognized.

Colour-blindness may occur in eyes whose power of vision, as to form and distance, is quite perfect, and may exist unknown to the person affected by it. This defect is common especially among men. The cause of it in almost every case which has been carefully investigated has been found to be seated in the sensorium, not in the visual apparatus. It will be easily understood that those whose eyesight is thus defective are disqualified from holding various positions.

COLOUR PRINTING. *See* PRINTING; PROCESS WORK.

COLOUR SYMBOLISM. At a very early period in human history symbolic use was made of colours. In the cave paintings of Palæolithic man of the Cro-Magnon races in the Aurignacian, Solutrean, and Magdalenian culture phases (Upper Palæolithic) the colours used were black, white, red, and yellow. A big red heart was depicted on the side of a mammoth, a fact which suggests that the heart was believed to be the seat of life, and that blood was identified with life and consciousness —"the blood that is the life thereof."

Imprints of human hands, which had been smeared with red ochre, are found on the walls of the Palæolithic caves. Red ochre was likewise smeared on corpses, as if to impart vitality to them by providing a colour-substitute for the "life blood." When the flesh decayed, the red ochre fell on and coloured the bones and the pebbles beside the bones. Yellow was possibly the fire colour, white that of day, and black that of night and death.

In Ancient Egypt the symbolic use of colour was very prevalent. There the colours green and blue first made appearance. Blue became known as the "Nile colour," and in some Asiatic languages is still referred to as "nil," "nilam," etc., which philologists connect with "Nile." The Egyptian blue and green were copper colours, and it is of interest to note in this connection that beliefs

associated with metal symbolism can be traced in Pyramid texts (*c.* 2500 B.C.), which refer to malachite powder dropping from the stars, and to the souls of the dead being provided with lumps of malachite and pieces of silver when they entered the golden sun-barque of the god Ra.

In *The Golden Bough*, Sir James Frazer asserts that the colours green, yellow, and black were those of corn-deities, the green god symbolizing green corn, the yellow god ripe corn, and the black god the black earth. The vegetation theory has not, however, received universal acceptance; indeed, it has been sharply criticized, and not a few think it has been very much overdone. For one thing, it does not account for the colours blue and red, which in Ancient Egypt were very prominent. In addition to the "green Osiris," there was a "green Ptah" of Memphis with a blue skull-cap and a golden beard. The "golden Hathor" is connected with gold in the texts and not with yellow corn. There was a blue Amon of Thebes. Horus was red; there was also a red-eyed Horus, a blue-eyed Horus, and a Horus with one eye black and the other white. Set, the Ancient Egypt devil, was shown sometimes black and sometimes red. The earlier Set, who was a beneficent deity, was either yellow or white. Set's metal was iron, as that of Horus was copper. Iron was the "metal of heaven" and "the ribs of Set." The god Ptah of Memphis was credited with having beaten the iron heaven into shape. The hieroglyph for iron is sometimes coloured blue.

Precious stones were valued because of their colours, and it seems to have been believed that their colours revealed their attributes. Malachite was connected with Osiris, turquoise with the goddess Hathor, and jasper with Isis—the jasper amulet of the love girdle was regarded as "a drop of the blood of Isis"—and green felspar was connected with the god Shu, who supported the heavens, after separating the sky-goddess Nut from the red earth-god Seb.

Sexes had their colours. Women were in early paintings given yellow skins, and men red skins. In other countries distinctive colours were given to the sexes. The Egyptians depicted Asiatics as yellow men. Apparently the division of races into Brown, Yellow, White, and Black men is of great antiquity. The seas were coloured. To the Egyptians the Red Sea was the Black Sea, and the Mediterranean the Green Sea ("the Great Green"). Asiatic seafarers knew the Mediterranean as the White Sea, the Red Sea as the Red Sea, and the Persian Gulf as the Yellow Sea.

The cardinal points and the winds were coloured. In Egypt the north is red, the south white, the east yellow, and the west black. Homer refers to the "white south wind." In Gaelic the north wind is black, the south wind is white, the west wind dun, and the east wind purple. China has a black north, a red south, a white west, and a blue east; Tibet a green north, a yellow south, a red west, and a white east; Ceylon a yellow north, a blue south, a red west, and a white east. The habit of colouring the cardinal points was widely prevalent in ancient times, and extended even to North America.

The planets were coloured; so were the Mythical Ages, the colours of which were associated with metals in Greece and India. Black is almost everywhere an evil colour associated with death, tempests, etc. "Black clings to hell," says a Sanskrit text. The importance anciently attached to colour is brought out very forcibly in a Chinese text, which says: "A dragon in the water covers himself with five colours. Therefore he is a god." In Ancient Egypt gods were painted green, blue, red, and yellow "to make them healthy," as a text states. Good colours thus renewed youth and ensured longevity or immortality.

COLOURS, Military. The military emblem or banner of infantry. "The colours" consist of two silken banners known as "the king's" and "the regimental" colour; on the latter, which is of the colour of the regimental facings, are embroidered on both sides the regimental devices and badge, and the battle honours authorized to be borne by that regiment.

Formerly colours were always carried in action, and their defence was a matter of the most supreme importance, many heroic deeds having been performed by the "colour parties" or escorts. In the British service, however, they have not been taken into action since 1879. In these days they are only carried on ceremonial parades, and on all such occasions are treated with the highest honours, individual officers and soldiers saluting and troops presenting arms. The name is confined to the banners borne by infantry (except rifle regiments), while those of cavalry are known as standards.

Colours are invariably carried by officers, while the cavalry standard-bearer is a non-commissioned officer. Colours are always accompanied by

an escort known as the "colour party," consisting of two officers and three senior non-commissioned officers. When "housed" or at rest they are always kept under guard.

COLOUR-SERGEANT. Formerly a non-commissioned officer who ranked higher and received better pay than an ordinary sergeant, and who, in addition to discharging all the ordinary duties of a sergeant, attended the colours on parade or near headquarters. There was one to each company of infantry. The rank was created in the British army in 1813. Since the introduction of the double-company system in 1914, the rank of colour-sergeant has been done away with; the duties are now performed by the company sergeant-major and company quarter-master-sergeant.

COLPORTEUR (kol-por-*teur'*). A French term now naturalized in England, and appropriated to a class of men always, or most commonly, subsidized by societies or associations with the view of disseminating religious literature by carrying about publications for sale, generally at reduced rates.

COLQUHOUN (ko-hön'), **Archibald Ross.** Traveller and public official, born 1848, died 18th Dec., 1914. Educated in Scotland, he entered the Indian Public Works Department, travelled extensively on various missions and for various objects in South-Eastern Asia, and was Deputy-Commissioner of Upper Burmah from 1885 to 1889. In 1890 he became Administrator of Mashonaland, subsequently made extensive travels in Asia, the Asiatic Archipelago and Pacific, America, the West Indies, etc.; and frequently acted as correspondent of *The Times*. He was a gold medallist of the Royal Geographical Society, and author of *Across Chrysê*, *Amongst the Shans*, *The Key of the Pacific*, *China in Transformation*, *The Renascence of South Africa*.

COLTON, Charles Caleb. English writer, born 1780, died by his own hand at Fontainebleau 1832. He held the united living of Kew and Petersham, but was eccentric in his manners, extravagant in his habits, and irremediably addicted to gambling and its attendant vices. Finding himself hopelessly in debt, he fled to the United States, and after a sojourn there of some years took up his abode in Paris, where he acquired a fortune of £25,000 by gambling, which was soon dissipated. Through apprehension of a surgical operation he committed suicide. He wrote several satirical poems, *Hypocrisy*, *Napoleon*, etc.; but his most remarkable work is *Lacon, or, Many Things in Few Words*.

COLT'S-FOOT (*Tussilāgo Farfāra*) A British weed of the ord. Compositæ,

Coltsfoot (*Tussilāgo Farfara*)
1, Disk Floret. 2, Ray Floret. 3, Fruit.

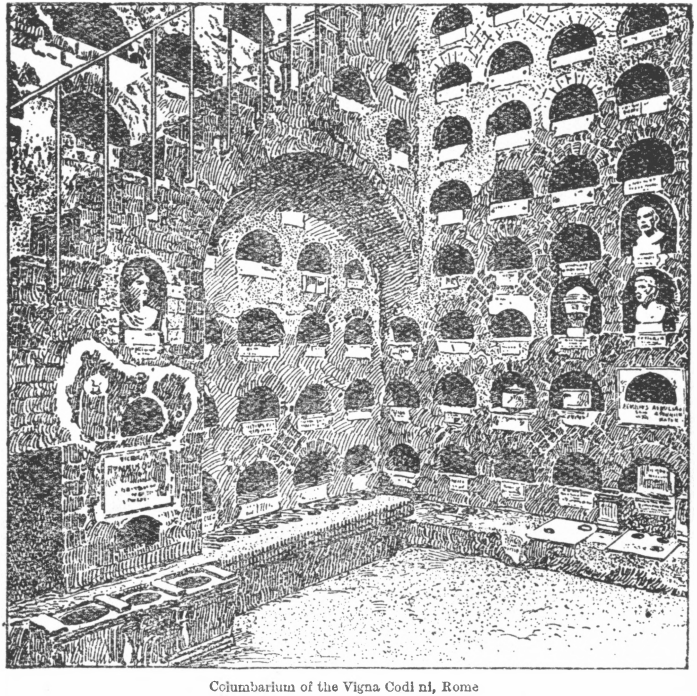
the leaves of which were once much employed as a remedy for asthma and coughs. The name is given from the leaf somewhat resembling the foot of a colt, being broad and heart-shaped; the flowers are yellow, and appear very early in spring.

COL'UBER. A genus of non-venomous serpents, which includes, besides several North American snakes, the *Coluber Æsculapii*, common in the neighbourhood of Rome, and regarded as the serpent which was sacred to Æsculapius, the god of medicine. To the same family belongs the common ringed snake of Britain (*Tropidonōtus natrix*), which attains a length of 3 or 4 feet.

COLUM'BA, St. A native of Ireland (Gartan, in Donegal), born 521, died at Iona 597. In 545 he founded the monastery of Derry, and subsequently established many churches in Ireland. About 563 he landed in the Island of Hy, now called Iona, and founded his Church. About 565 he went on a mission to convert the Northern Picts, and traversed the whole of Northern

Scotland preaching the Christian faith and founding monasteries, all of which he made subject to that which he had set up on the Island of Hy.

The Columban Church was in some points of doctrine and ceremonial opposed to that of Rome, to which it owed no allegiance. Shortly before his death he revisited Ireland. There is a well-known life of St. Columba, *Vita Sancti Columbæ*, written by St. Adamnan, who became Abbot of Iona in 679.—BIBLIOGRAPHY: W. Reeves, *Life of St. Columba, written by Adamnan*; W. F. Skene, *Celtic Scotland*.



Columbarium of the Vigna Codi ni, Rome

COLUMBA'NUS, Saint, or **SAINT COLUMBAN.** A missionary and reformer of monastic life, born in Ireland apparently about 543, became a monk in the Irish monastery of Benchor (Bangor, County Down), went through England to France with twelve other monks to preach Christianity, and founded the monasteries of Annegray, Luxeuil (590), and Fontaine in Burgundy.

His rule, which was adopted in later times by many monasteries in France, commanded blind obedience, silence, fasting, prayers, and incessant labour. It was much more severe than the Benedictine rule, and punished the smallest offences of the monks with stripes. He retained, also, the old ecclesiastical customs of the Irish, among which was the celebration of Easter at a different time from the Roman Church.

He appears to have remained at Luxeuil for nearly twenty years. He then went among the heathen Alemanni, and preached Christianity in Switzerland. About 612 he passed into Lombardy, and founded the monastery of Bobbio, in which he died in 615. His writings comprise his monastic rule, sermons, some poems and ecclesiastical treatises.

His *Life* was written by Abbot Jonas, a successor in the abbacy of Bobbio. —Cf. Migne, *Patrologiæ Cursus Completus*.

COLUMBA'RIUM. In Roman antiquities, a place of sepulture for the ashes of the dead after the custom of burning the dead had been introduced. Columbaria consisted of arched and square-headed recesses formed in walls, in which the cinerary urns were deposited, and were so named from the resemblance between these recesses and those formed for the doves to build their nests in a dove-cot. Several perfect examples have been found near Rome, such as those of the Vigna Codini, in the Licinian Gardens.

COLUM'BIA. The capital of South Carolina, situated on an elevated plain on the left bank of the Congaree. It is regularly laid out, and contains some fine public buildings, including the State-house. Among the educational institutions are the South Carolina University, founded in 1805; the Allen University, founded in 1880 for negroes; and a Presbyterian theological college. Pop. 50,211.

COLUMBIA. A city of the United States, in Pennsylvania, on the Susquehanna, a great mart for lumber. Pop. 11,454.

COLUMBIA, British. *See* BRITISH COLUMBIA.

COLUMBIA, District of. A small tract of country in the United States, on the Potomac, about 120 miles from its mouth, surrounded on three sides by Maryland, forming a neutral district for the seat of national government. It has an area of 70 sq. miles, and a pop. of 486,869. A portion of the District of Columbia is known as the city of Washington, which has been the national capital since 1800 (and now includes also Georgetown). Since 1st July, 1878, the affairs of the district and of Washington are administered by three commissioners directly under Congress.

COLUMBIA RIVER, or OREGON. A river in North America, flowing into the Pacific Ocean, and rising at the base of the Rocky Mountains in British Columbia. It has a very winding course, partly in British Columbia, but mainly in the United States, where it receives two large tributaries, Clark's River and Snake River. It then turns abruptly to the west, and forms the boundary between Washington Territory and Oregon. It drains an area of 258,000 sq. miles, and has a length of about 1400 miles.

COLUMBIA UNIVERSITY. A great educational institution in New York, chartered in 1754, giving graduate and other courses of instruction in literature, education, divinity, science, medicine, law, etc. There are about 858 professors and teachers, and over 6000 students in the university, including all departments.

COLUM'BIDÆ. The pigeon family of birds. They are characterized by the hinder toe being well developed, by the double dilatation of the crop, and by their habit of feeding their young with food disgorged from this receptacle.

COL'UMBINE. The popular name of plants of the genus Aquilegia, ord.

Wild Columbine (*Aquilegia vulgaris*)

Ranunculaceæ, with five coloured sepals and five spurred petals. The common columbine (*A. vulgāris*) is a favourite garden flower, and owes its name to the fancied resemblance of the petals to the form of pigeons (Lat. *columba*).—In the language of flowers the columbine is emblematic of ingratitude (cf. *Hamlet*, iv. 5, 180).

COL'UMBINE. In the older pantomimes, a female mask with whom Harlequin was in love; their marriage formed the dénouement. In modern pantomime the chief female dancer in the harlequinade. *See* PANTOMIME.

COLUMBITE. A mineral tantalate and niobate of iron and manganese ($(FeMn)(NbTa)_2O_6$). It is black and heavy, and occurs in granitoid rocks

or their alluvial sands; it with its ally tantalite is the great source of the tantalum now used for the filaments of incandescent lamps.

COLUM'BIUM. *See* NIOBIUM.

COLUM'BUS, Christopher (in Sp. *Christoval Colon*; in It. *Christoforo Colombo*, which is his real name), Was born in Genoese territory in 1451, died at Valladolid, Spain, 1506. His father, Domenico Colombo, a poor wool-comber, gave him a careful education. He appears to have gone to sea at an early age and to have navigated all parts of the Mediterranean and some of the coasts beyond the Straits of Gibraltar. In 1470 we find him at Lisbon, where he married the daughter of Bartolommeo de Perestrello, a distinguished navigator.

Christopher Columbus

He had gradually come to the conclusion that there were unknown lands belonging to Eastern Asia separated from Europe by the Atlantic; whilst the Portuguese were seeking to reach India by a south-east course round Africa, he was convinced that there must be a shorter way by the west. He applied in vain to Genoa for assistance, and equally fruitless were his endeavours to interest John II. of Portugal in the enterprise. He then determined to apply to the Spanish court; and after many disappointments he induced Ferdinand and Isabella to equip and man three vessels for a voyage of discovery.

It was early in the morning of Friday, the 3rd of Aug., 1492, that Columbus set sail from the port of Palos, and after sailing for two months the expedition narrowly escaped failure. The variation of the needle so alarmed the crews that they were on the point of breaking out into open mutiny, and he was obliged to promise that he would turn back if three more days brought no discovery.

On the third day (12th Oct., 1492) the Island of Guanahani or San Salvador was sighted, which Columbus believed to belong to Eastern Asia and to be connected with India —a belief which he carried with him to his grave. Hence the mistaken name of *Indians* applied to the natives of America, and that of *West Indies* applied to the group of islands of which Guanahani forms one. On landing Columbus threw himself upon his knees and kissed the earth, returning thanks to God. The natives collected round him in silent astonishment, and his men, ashamed of their disobedience and distrust, threw themselves at his feet, begging his forgiveness. Columbus, drawing his sword, planted the royal standard, and in the name of his sovereigns took possession of the country, which, in memory of his preservation, he called *San Salvador*.

He then sailed in search of other lands, and discovered Cuba, St. Domingo, and some other of the West Indian Islands. Being so far successful, he built a fort at Hispaniola, Hayti, left some of his men there, and set out on his return to Europe, where he was received with almost royal honours. In 1493 he set out on his second great voyage from Cadiz, with three large ships of heavy burden and fourteen caravels, carrying 1500 men. He discovered the Island of Dominica, and afterwards Mariegalante, Guadeloupe, and Porto Rico, and at length arrived at Hispaniola. Finding the colony destroyed, he built a fortified town, which he called, in honour of the queen, *Isabella*. He then left the island in order to make new discoveries, visited Jamaica, and returning after a voyage of five months, worn out with fatigue, found to his great joy that his brother Bartolommeo had arrived at Isabella with provisions and other supplies for the colony.

Meanwhile a general dissatisfaction had broken out among his companions, who, instead of the expected treasures, had found hardships and labour. This and news of calumnies being set on foot against him at home induced him to return to Spain, where his presence, and probably also the treasure he brought, silenced his enemies.

In May, 1498, he sailed with six

vessels on his third voyage. Three of his vessels he sent direct to Hispaniola; with the three others he took a more southerly direction, and having discovered Trinidad and the continent of America, returned to Hispaniola. His colony had now been removed from Isabella, according to his orders, to the other side of the island, and a new fortress erected called St. Domingo. Columbus found the colony in a state of confusion, but soon restored tranquillity.

His enemies, in the meantime, endeavoured to convince his sovereigns that his plan was to make himself independent, and Columbus was not only displaced, but Francisco de Bobadilla, a new governor who had come from Spain, even sent him to that country in chains. On his arrival (in 1500) orders were sent directing him to be set at liberty and inviting him to court, but for this injurious treatment he never got redress, though great promises were made. After some time he was able to set out on his fourth and last voyage (1502) in four small vessels supplied by the court. In this expedition he was accompanied by his brother Bartolommeo and his son Hernando. He encountered every imaginable disaster from storms and shipwreck, and returned to Spain, sick and exhausted, in 1504.

The death of the queen soon followed, and he urged in vain on Ferdinand the fulfilment of his promises; but after two years of illness, humiliations, and despondency, Columbus died at Valladolid. His remains were transported, according to his will, to St. Domingo, but on the cession of Hispaniola to France they were removed to Havana, in Cuba, in 1796. In 1899, after the Spanish-American War and the loss of Cuba, they were removed to Seville Cathedral, where they remain.—BIBLIOGRAPHY: Washington Irving, *History of the Life and Voyages of Christopher Columbus*; A. von Humboldt, *Examen Critique*; H. Harrisse, *Christophe Colomb*; J. Winsor, *Christopher Columbus*; Charles J. Elton, *Career of Columbus*; Filson Young, *Christopher Columbus and the New World of his Discovery*.

COLUM'BUS. A city of the United States, the capital of Ohio, in Franklin County, on the east bank of the Scioto, near the centre of the state. It contains some notable public buildings. The capitol is second in size only to that of Washington, and is built of grey limestone in the simple Doric style. Other buildings are the deaf and dumb institution, institution for the blind, lunatic asylum, penitentiary, Roman Catholic cathedral, etc. Educational institutions include the State university, Columbus medical college, Starling medical college, etc. There is a very extensive trade, and the manufactures are important and varied. Pop. 290,564.

COLUMBUS. A town in the United States, in Georgia, on the Chattahoochee River, well built, with cotton and other manufactures. Pop. 43,131.

COLUMBUS. A city of the United States, Indiana, not far from the centre of the state, at the junction of railways. Pop. 9935.

COLUMEL'LA, Lucius Junius Moderatus. Roman writer on agriculture, born at Cadiz, in Spain; lived about the middle of the first century after Christ, and wrote a work on agriculture (*De Re Rustica*) in twelve books, which are still extant. The tenth book treats of gardening, and is written in hexameters; it forms a sort of supplement to the *Georgics*.

COL'UMN (Lat. *columna*). In architecture, a round pillar, a cylindrical solid body set upright and primarily intended to support some superincumbent weight. A column has as its most essential portion a long solid body, called a *shaft*, set vertically on a *stylobate*, or on a congeries of mouldings which forms its *base*, the shaft being surmounted by a more or less bulky mass which forms its *capital*. In classical architecture columns have commonly to support an *entablature* consisting of three divisions, the *architrave*, *frieze*, and *cornice*, adorned with mouldings, etc.

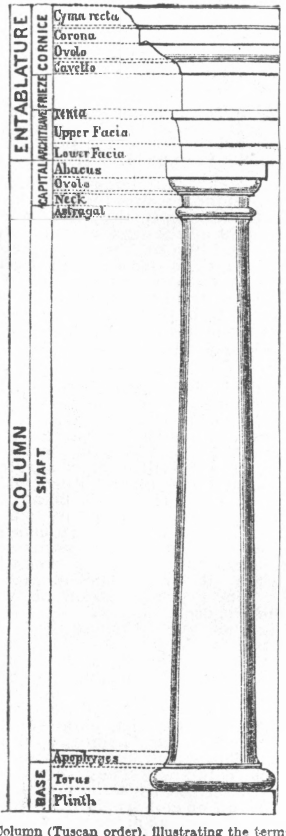
Columns are distinguished by the names of the styles of architecture to which they belong; thus there are Hindu, Egyptian, Grecian, Roman, and Gothic columns. In classic architecture they are further distinguished by the name of the order to which they belong, as Doric, Ionic, Corinthian, Composite or Tuscan columns. They may also be characterized by some peculiarity of position, of construction, of form, or of ornament, as attached, twisted, or cabled columns. Columns are chiefly used in the construction or adornment of buildings. They have also been used, however, singly for various purposes, especially for monuments.

COLUMN. In military drill, bodies of troops in parallel and successive alignments, at a distance from one another equal to their own frontage,

e.g. column of companies or column of platoons.

Close Column, a column with distances reduced to suit requirements. If no specific orders are given, the distance between units is seven paces.

Column of route, a column of fours with not more than four men abreast



Column (Tuscan order), illustrating the terms applied to the several parts

on any part of the column, including officers and supernumeraries. The formal formation for troops marching on a road.

COL'URE. In astronomy, one of two great circles at right angles to each other, passing through the poles of the celestial sphere. One passes through the solstitial and the other through the equinoctial points of the ecliptic.

COLWYN BAY. A watering-place of North Wales, Denbighshire, beautifully situated and with fine surroundings; it has a promenade and piers, hotels and hydropathic. The population in 1931 was 20,885.

COLYM'BUS. The diver genus of birds, giving name to the family Colymbidæ.

COLZA OIL. An oil much employed for burning in lamps, and for many other purposes. It is expressed from the seeds of *Brassica campestris oleifera*, and from allied plants of the cabbage family. It is yellowish-brown, and has little or no smell. It becomes thick and solid only at very low temperatures.

COMA (Gr. *kōma*, deep sleep). In medicine, a state of complete insensibility, resulting from various diseases, as apoplexy, diabetes, and inflammation of the kidneys; from narcotics, as opium; from accident or injury to the brain; or from excessive cold.

COMA (Gr. *kōmē*, hair). The head or essential part of a comet, of a nebulous appearance, and commonly spherical or oval in form. In many cases there is near its centre a star-like point, termed the nucleus.

COMA BERENI'CES, or **BERENICE'S HAIR.** A small constellation of the northern hemisphere containing about forty stars visible to the naked eye, situated between Boötes and the tail of Leo. It was first delimited by Tycho Brahe.

COMACCHIO (ko-mak'ki-ō). A fortified town, Italy, province of Ferrara, amidst unhealthy marshes, about 2 miles from the Adriatic, with productive fisheries. It is the seat of a bishop. Pop. 10,900.

COMA'NA. An ancient city of Cappadocia, celebrated in antiquity as the seat of the solemn worship of Ma (the moon goddess). Its site has not been identified.

COMANCHES (kō-man-chez). An American Indian tribe formerly roaming through Texas and part of Mexico. They were excellent horsemen, and extremely warlike, but their numbers are now insignificant. Some of them have been collected on a reservation in the western part of the United States Indian Territory. They now number about 1100.

COMAYAGUA (kō-mā-yä'gwä). A town of Central America, in Honduras, the capital of department of the same name, situated on the southern border of the Plateau of

Comayagua, about midway between the two oceans. The university, founded in 1678, has ceased to exist, but there is a school of jurisprudence. Pop. about 8000.

COMB. An instrument with teeth, made of tortoise-shell, ivory, horn, wood, bone, metal, or other material, used for dressing the hair, and by women for keeping the hair in its place when dressed. Combs have been used from the earliest times by rude as well as by civilized races.

COMBACO'NUM, or **KUMBAKONAM.** A town of India. Presidency of Madras, district of Tanjore. It was the ancient capital of the Chola dynasty, and is one of the most ancient and sacred towns in the presidency. It has a great many well-endowed Hindu temples, a Government college, courts, etc. A brisk trade is carried on with visitors and pilgrims. Pop. 60,700.

COMBE, Andrew. Born at Edinburgh, 1797, died 1847. He was educated at Edinburgh High School, and afterwards for the medical profession at the university there. In 1822 he commenced practice at Edinburgh, and had considerable success. In 1838 he was appointed one of the physicians extraordinary to the queen in Scotland. His chief works are: *Observations on Mental Derangement* (1831), *Principles of Physiology* (1834), *Physiology of Digestion* (1836), and *A Treatise on the Physiological and Moral Management of Infancy* (1840). Like his brother George, he was a zealous phrenologist.

COMBE, George. Brother of the foregoing, was born 1788, at Edinburgh, died at Moor Park, Surrey, 1858. He was educated for the legal profession, and in 1812 was admitted a member of the Society of Writers to the Signet. He was the first to introduce the doctrines of phrenology into Great Britain; and visited Germany and America lecturing on his favourite science. He was also a zealous promoter of the cause of popular education and social progress; and was among the first to advocate compulsory education and the establishment of a Board of Health.

Besides writing *The Constitution of Man*, published in 1828, he was the author of *A System of Phrenology* (1825), *Lectures on Popular Education* (1833), *Moral Philosophy* (1840), *The Life and Correspondence of Dr. Andrew Combe* (1850), *Principles of Criminal Legislation and Prison Discipline Investigated* (1854), and *The Relation between Science and Religion* (1857).

COMBE, William. *See* COOMBE, WILLIAM.

COMBERMERE, Stapleton Stapleton-Cotton, Viscount. English general, born in 1773, died 1865. He entered the army in 1790, and took part in the Mysore War against Tippoo Sahib in 1798 and 1799, and at the storming of Seringapatam. He served with distinction through the Peninsular War, and was commander of the allied cavalry after 1810. In 1814 he was created Baron Combermere. In 1825 he was appointed commander-in-chief in India, and was raised to the rank of viscount in 1826 after he had captured Bhurtpore. He was afterwards Constable of the Tower, and a field-marshal.

COMBES, Justin Louis Émile. French politician, born 1835 at Roquecourbe, department of Tarn. Although at first intended for the Church, he became a doctor instead, and settled down in the country as a medical practitioner. In 1885 he entered the Senate, where he became a prominent leader of the Radical Republican party. He was Vice-President of the Senate in 1893, Minister of Education in 1895, and succeeded Waldeck-Rousseau as Premier in 1902. It was during his ministry that the war on the Church, started by Waldeck-Rousseau, was carried into effect, and resulted in the closing of over 500 schools run by priests, and in the final separation (in 1905) of Church and State. In his hatred of clericalism Combes was a thorough Voltairian. He resigned in 1905, but was minister without portfolio in 1915. He died 24th May, 1921.

COMBINATION. Acting together. The combination laws were Acts of Parliament passed in 1799 and 1800 to make trade unionism illegal. Their provisions included imprisonment for any working man who combined with another to obtain higher wages or shorter hours. Owing to the efforts of Francis Place the laws were repealed in 1824. Combination is now allowed, although it is illegal if against public policy. It takes the form of trade unions among the employed and of combines among the employers. *See* TRADE UNION.

A Combine is a union of business firms. The tendency to form combines has been very marked since the Great War. They tend to lower working costs and to organize large selling plans. In the United States, where they are known as trusts, legislation has been passed against them.

COMBRETA'CEÆ. An order of shrubby or arborescent polypetalous dicotyledons, tropical shrubs or trees, with leaves destitute of stipules, and long slender stamens. Some of them are astringent and used for tanning (myrobalans), and the kernels of others are eatable. They are chiefly valued for their brightly coloured showy flowers, especially in the genus Combrĕtum.

COMBUSTION. The operation of fire on inflammable substances; or the union of an inflammable substance with oxygen or some other supporter of combustion, attended with heat and in most instances with light. As the combination of the carbon in fuel with the oxygen of the air is the commonest method of getting heat and light, and as when the action takes place the fuel is said to burn or undergo combustion, the latter term has been extended to those cases in which other bodies than carbon—for example, phosphorus, sulphur, or metals—burn in the air or in other substances than air—for example, chlorine.

Though the action between the gas and the more solid material, as coal, wood, charcoal, of whose combination combustion is the result, is mutual, the one having as much to do with the process as the other, yet the former, as oxygen, chlorine, iodine, and the compounds which they form with each other and with nitrogen, have received the name of supporters of combustion, while to the latter the term combustibles has been assigned. Combustion, like other chemical actions, is attended by the release of a definite amount of energy, proportional to the weight of the material consumed. Practically the whole of this energy appears in the form of heat.

Spontaneous Combustion is the ignition of a body by the internal development of heat without the application of fire. It not infrequently takes place among heaps of rags, wool, and cotton when lubricated with oil; hay and straw when damp or moistened with water; and coal in the bunkers of vessels. In the first case the oil rapidly combines with the oxygen of the air, this being accompanied by great heat; in the second case the heat is produced by a kind of fermentation; in the third the iron pyrites, which occurs in many kinds of coal, is oxidized to sulphate of iron in the presence of air and moisture, and so much heat is evolved that the mass takes fire.

The term is also applied to the extraordinary alleged phenomenon of the human body being reduced to ashes without the direct application of fire. The most famous supposed case of this occurring is that of the Countess Cornelia de Bandi. It is said to have occurred in the aged and persons that were fat and hard drinkers; but most chemists reject the theory altogether, maintaining that none of the instances adduced are well authenticated.

Combustion, in Practical Chemistry.—The estimation of carbon and hydrogen in a substance is usually made by the process known as a *combustion*, the carbon being oxidized to carbon dioxide, and the hydrogen to water.

COMÉDIE FRANÇAISE (la Maison de Molière, or le Français). The national subsidized theatre of France, formed in 1680 by the fusion of the two bodies into which Molière's company of actors had split. It is at present managed by regulations which Napoleon I. drew up at Moscow in 1812, modified by subsequent resolutions of 1858 and 1859. The historic building was partly destroyed by fire in 1900, but was promptly rebuilt.

COMEDIET'TA. A dramatic composition of the comedy class, but not so much elaborated as a regular comedy, and generally consisting of one or at most two acts.

COMEDY. A drama of a light and amusing nature, usually having a happy ending. For some time the happy ending was considered the essential attribute of a comedy. Comedy is usually contrasted with tragedy, these two being the two great divisions of dramatic art, but it may also be contrasted with farce and burlesque. Farce has been defined as inadequately motivated comedy; farces often begin with a postulate which must be granted by the audience, but which is in itself impossible or improbable. Burlesque is mere caricature. Of course, not infrequently plays are neither comedies nor farces, but must be placed in a sort of No Man's Land between the two.

Aristophanes is the only Greek comic poet of whom any complete plays have been preserved. He stands unapproachable as Shakespeare. Comedy in his hands was more like a titanic burlesque, and it depended for its existence upon the peculiar conditions of the Attic theatre. He has had no imitators. Much more influential have been the comedies of the Romans Plautus and Terence, men of much less account, who have nevertheless had an abiding influence in comedy down to to-day.

To endeavour to enumerate all the writers of good comedies would take too long. Shakespeare must be accounted among the very greatest writers of comedy, not only in his plays that are classed as comedies, but in many scenes of his historical plays. Molière is the greatest master of society comedy in the world, and he has had a profound influence on later writers. At the end of the seventeenth and beginning of the eighteenth centuries a brilliant school of artificial comedy writers flourished in England, the principal members being Congreve, Vanbrugh, and Farquhar.

Later in the eighteenth century Sheridan and Goldsmith both produced excellent comedies which still hold the stage. Comedy was under a cloud during the earlier part and the middle of the nineteenth century; Gilbert, brilliant as he was on his own lines, did not achieve a real comedy; and H. J. Byron and T. W. Robertson are of the stage, stagey. Not until the production of Wilde's *Lady Windermere's Fan* in 1892 was there anything like a comedy with literary as well as dramatic value.

In modern times many brilliant and witty writers have turned their attention to the stage. Famous names are those of Sir Arthur Wing Pinero, whose masterpiece is *The Second Mrs. Tanqueray*; Oscar Wilde; Bernard Shaw; Sir J. M. Barrie. Others worthy of note are Somerset Maugham, author of the brilliantly satiric play, *Our Betters*; Frederick Lonsdale; Lennox Robinson; St. John Ervine; Stanley Houghton; Allan Monkhouse; Noel Coward (born 1899) is one of the foremost English dramatists. His comedies include *I'll Leave it to You*, *The Young Idea*, and *Private Lives* (1930). *See* DRAMA. BIBLIOGRAPHY: George Meredith, *Essay on Comedy and the Comic Spirit*; H. Bergson, *Le Rire, Essai sur la signification du Comique*.

COME'NIUS, Johann Amos. A Moravian educational reformer, born 1592, died 1670. He was chosen bishop of the Moravian Brethren, and suffered much in the persecutions of that body. He was the author of upwards of ninety works, the most important of which are *Janua Linguarum Reserata* (1631) and *Orbis Sensualium Pictus* (1658). His high reputation brought him invitations from England, Sweden, and Hungary to aid in organizing public instruction; and the above works have been frequently translated and imitated.

COMET. Earliest British passenger steamship. Built by Henry Bell (1767-1830) at Greenock in 1811, it plied between Glasgow and Greenock thrice weekly between 1812 and 1820. It was a paddle steamer 42 feet long, equipped with a 3 horse-power engine.

COM'ETS. Certain celestial bodies which appear at irregular intervals, moving through the heavens in paths which seem to correspond with parabolic curves, or in a few instances in elliptical orbits of great eccentricity. The former, after being visible from the earth for a shorter or longer time, disappear into space possibly never to return; the latter return to us periodically. Some comets are visible only by the aid of the telescope, while others can be seen by the naked eye. One of the latter class generally appears like a star with a tail or train of light, sometimes short and sometimes extending over half the sky, usually single, and more or less curved, but sometimes branching. In a comet which appeared in 1744 the tail was divided into several branches, spreading out from the head like a fan.

The tail is not stationary relatively to the head, but is subject to remarkable movements. The direction in which it points is always opposite to the sun, and as the comet passes its perihelion the tail changes its apparent position with extraordinary velocity. The head of the comet is itself of different degrees of luminosity, there being usually a central core, called the *nucleus*, of greater brilliancy than the surrounding envelope, called the *coma*.

Scientific Speculations. — Comets were long regarded as supernatural objects, and usually as portents of impending calamity. Tycho Brahe was the first who expressed a rational opinion on the subject, coming to the conclusion that the comet of 1577 was a heavenly body at a greater distance from the earth than that of the moon. The general laws of the motions of bodies, as well as his own observations on the comet of 1680, led Newton to conclude that the orbits of the comets must, like those of the planets, be ellipses, having the sun in one focus, but far more eccentric; and having their aphelia, or greatest distances from the sun, far remote in the regions of space.

Halley's Comet.—This idea was taken up by Halley, who collated the observations which had been made of all the twenty-four comets of which notice had been taken previous to 1680. The results were very interesting. With but few exceptions the comets had passed within less than the earth's distance from the

sun, some of them within less than one-third of it, and the average about one-half. Out of the number, too, nearly two-thirds had had their motions retrograde, or moved in the opposite direction to the planets.

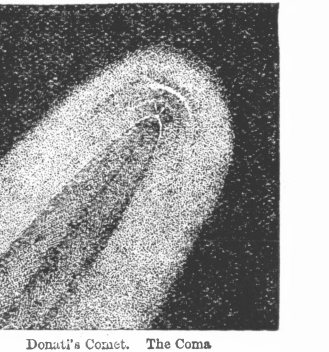
While Halley was engaged on these comparisons and deductions the comet of 1682 made its appearance, and he found that there was a wonderful resemblance between it and three other comets that he found recorded—the comets of 1456, of 1531, and of 1607. The times of the appearance of these comets had been at very nearly regular intervals, the average period being between seventy-five and seventy-six years. Their distances from the sun, when in *perihelion*, or when nearest to that luminary, had been nearly the same, being nearly six-tenths of that of the earth, and not varying more than one-sixtieth from each other. The inclination of their orbits to that of the earth had also been nearly the same, between 17° and 18°; and their motions had all been retrograde.

Putting these facts together, Halley concluded that the comets of 1456, 1531, 1607, and 1682 were reappearances of one and the same comet, which revolved in an elliptic orbit round the sun, performing its circuit in a period varying from a little more than seventy-six years to a little less than seventy-five; or having, as far as the observations had been carried, a variation of about fifteen months in the absolute duration of its revolution, measured according to that of the earth. For this variation in the time of its revolution Halley accounted upon the supposition that the form of its orbit had been altered by the attraction of the remote planets Jupiter and Saturn as it passed near to them; and thence he concluded that the period of its next appearance would be lengthened, but that it would certainly reappear in 1758 or early in 1759.

As the time of its expected reappearance approached, Clairaut calculated that it would be retarded 100 days by the attraction of Saturn, and 518 by that of Jupiter, so that it would not come to the perihelion, or point of its orbit nearest the sun, till the 13th of April, 1759. It actually reached its perihelion on the 13th of March, 1759, being thirty-one days earlier than he had calculated.

Along with the period of this comet and its perihelion distance, the magnitude and form of its path were also calculated. Its greatest distance from the sun was calculated as about 3,300,000,000 and its least about 55,000,000 miles. The comet therefore belonged to the solar system, and was quite beyond the appreciable attraction of any body which did not belong to that system, and as this was determined of one comet, analogy pointed to it as probably true of others. In 1835 it again returned being first seen at Rome on 5th Aug., and was observed for several months.

Encke's, Biela's and Donati's Comets.—The comet denominated *Encke's comet*, which has made repeated appearances, was first observed in 1818, and was identified with a comet observed in 1786, also with a comet discovered in 1795 by Miss Herschel in the constellation Cygnus, and with another seen in 1805. Its orbit is an ellipse of comparatively small dimensions, wholly within the orbit of Jupiter; its period is 1206 days, or about three years and three-tenths. It has been frequently observed since.



Donati's Comet. The Coma

Another comet, discovered in 1826, the history of which is of the utmost importance in reference to the relationship of comets and the periodic showers of shooting-stars, it known as Biela's comet. It revolved about the sun in about 6¾ years, and was identified as the same comet which was observed in 1772 and in 1806. Its returns were noted in 1832, 1839, and 1845. In 1846 it divided into two, returned double in 1852, but has not since been seen, the supposition being that it has been dissipated, and that it was represented by a great shower of meteors that was seen on 27th Nov., 1872, and again on 27th Nov., 1885. One of the most remarkable comets of last century was that known as Donati's, discovered by Dr. Donati of Florence in 1858. It was a conspicuous sight in Britain in the autumn, and on 18th Oct. narrowly missed colliding with Venus.

Orbits of the Comets.—The paths in which comets move are not, like those of the planets, all nearly in the same plane as the orbit of the earth. Leaving out the asteroids or minor planets, the orbits of all the others except the smallest, Mercury, whose inclination is 7°, are contained within a zone extending only 3½° on each side of the ecliptic, or plane of the earth's orbit. But the orbits of the comets are at all possible angles. About three-fourths of all the comets that have been observed have their perihelia at a less distance than the earth's. Twelve approached the sun within 5,000,000 miles, those of 1843 and 1882 passing within 100,000 miles of the sun's surface. Only eleven have had a perihelion distance exceeding twice the earth's mean distance, while one only, that of 1729, had one of four times. But the great preponderance of distances less than the earth's is doubtless largely due to the fact that comets approaching the sun so closely are much more likely to be seen by us.

Comet Families.—In addition to Halley's, Encke's, and Biela's comets, mentioned above, many others have been ascertained to be periodic, and have been seen at several returns. They comprise what are known as comet "families," which appear to have relation to the larger and distant planets. Those with the shortest periods, ranging from three to eight years, have all a point at which their orbits pass close to Jupiter's, and they are supposed to have been introduced into their present paths by his attraction. Others are similarly related to Saturn, Uranus, and Neptune, the six Neptune comets having periods of about seventy-five years. Halley's famous comet is one of these six. There also seem to be other families of still greater periods, possibly bearing a similar relationship to more remote and as yet undiscovered planets.

Another theory of the connection with the respective planets is that these comets were ejected from the planets at remote epochs in the past, when the planets were in a sun-like state. All the comets which have been ascertained to revolve in ellipses with periods under 100 years, with two exceptions, move in the same direction as the planets. The exceptions are Halley's comet, and Tempel's comet of 1866 with which the Leonid meteor stream is associated. Other comets have been nearly equally divided between direct and retrograde motions.

In addition to the comet families mentioned already as related to particular planets there are comet "groups," each consisting of a number apparently related to each other, as they revolve in almost precisely coincident paths. Thus the comets of 1668, 1843, 1880, and 1882 had almost identical orbits, but in the cases at any rate of the last three they were certainly different comets, as they all had evidently long periods. In such a case apparently the comets had a common origin, or were perhaps once one comet, which divided into portions travelling with slightly different speeds, and separating widely in the course of ages.

Composition.—That the comets are formed of matter of some sort or other we know from the dense and opaque appearance of the nucleus, as well as from the action of the planets upon them; but as their action upon the planets has not been great, or even perceptible, we are led to the conclusion that they are bodies of extreme tenuity of constitution. But the dimensions of comets are colossal; in some cases they greatly exceed the sun himself in bulk. In most cases the coma or head is larger than the earth. That of the comet of 1811 was nearly one-half greater in diameter than the sun.

When a comet is viewed through a telescope there generally appears a nucleus, or star-like point, within the coma. This may be only 100 miles in diameter, or may be as large as the earth. The tail of a conspicuous comet is usually as much as 10,000,000 miles long, and may be ten times that length. As it commonly expands towards the extremity, having a somewhat conical form, its volume may often exceed enormously the sun's. Nevertheless, on account of their tenuous nature, it is believed that all the comets recorded in history may not have had a greater aggregate mass than the moon.

It is curious that when near the sun the head of a comet ordinarily contracts. This may be due to matter becoming vaporized and rendered less visible. The tail in general becomes larger with approach to the sun, and shortens or totally vanishes as the comet recedes. At the last visit of Halley's comet, in 1910, its head passed exactly between the sun and earth, about 15,000,000 miles from the latter. Its tail was much longer than that, and some authorities believe that the earth passed through it. Others think that owing to its curvature the tail passed clear of the earth, and there is some reason to believe that the tail was detached from the comet—it is suggested through a repulsive action exerted by the earth.

At any rate the tail was still seen in the eastern sky for a morning or two after the date of the approach, while the comet itself appeared in the western evening sky, with a much shorter and apparently newly formed tail. The comet presented a magnificent spectacle in lower and southern latitudes, but was seen to little advantage in Britain. Its head was not visible while in transit across the sun's disc, showing that it must consist only of transparent vapour or solid particles of comparatively small dimensions.

Origin.—It had long been believed that many comets, those which appear to revolve in parabolic orbits, were travellers from external space, visiting our solar system once under the sun's attraction, and leaving it never to return. This theory has recently been much called in question. An elliptic orbit of great eccentricity, such as would be described in some thousands of years, would be indistinguishable to us, from the small portion we can observe, from a parabola.

If comets were visitors from other systems, some of them should naturally have hyperbolic orbits. There are no certain cases of such, except one or two where the path seems to have been made hyperbolic by the perturbative influence of the planets of our own system. Hence it may be that all the comets observed were members of the solar system, being, so to speak, the debris of the hypothetical original nebula, which has not been aggregated into the compact bodies of the planets. On this supposition the comet families have not been captured and added to our system by the planets, but only introduced by them into their present orbits, having probably had formerly much larger orbits and longer revolution periods.

The spectroscope shows that comets shine partly by reflected sunlight, but are also self-luminous, especially when near the sun. The materials indicated comprise compounds of carbon, such as hydrocarbons and cyanogen, and metals, e.g. sodium, and, in one case at least, iron.

The orbits of some comets are identical with the orbits of particular showers of shooting-stars. This was first demonstrated by the Italian astronomer Schiaparelli, who proved the agreement between the orbit of the great comet of 1862 and that of the star-shower seen annually about 9th or 10th Aug. It is probable that every meteoric stream follows in the train of some comet large or small, which either exists now or has been dissipated, as Biela's comet was, leaving only its meteoric trail to show where it once travelled; and that every comet is followed or preceded by a train of meteors, extending over a greater or less portion of the comet's orbit according to the length of time during which the comet has existed.

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COM'FREY. A name given to several European and Asiatic plants

Prickly Comfrey (*Symphytum asperrimum*)

of the genus Symphytum, nat. ord. Boraginaceæ. The common comfrey, *S. officinale*, is found in Britain on the banks of rivers and ditches.

COMINES, Philippe de. *See* COMMINES.

COMISO (kō-mē'sō). A town of Sicily, province of Syracuse. Pop. 26,624.

COMITADJI. Bulgarian revolutionary troops and armed bands, first formed in 1894 to help the Macedonians in their struggle against the Turks. They kept up a guerilla war against the enemy, and even when Macedonia was taken over by Serbia these bands did not disappear. Continuing to roam about in the mountains, they pillaged and attacked the new owners. During the European War, when Bulgaria joined the

Central Powers, bands of comitadjis fought the Allies.

COMITIA. With the Romans, the assemblies of the people in which such public business was transacted as the election of magistrates, the passing of laws, etc. These were of three kinds :—1. The *comitia curiata*, or assemblies of the patrician houses or *populus* in wards or *curiæ*. 2. The *comitia centuriata*, or assemblies of the whole Roman people, including patricians, clients, and plebeians in divisions called *centuries*. These assemblies are said to have been instituted by King Servius Tullius as a counterpoise to the powers of the *comitia curiata*. After the institution of the *centuriata* the functions of the *curiata* were almost confined to the election of priests, and the confirmation of dignities imposed by the people. The *centuriata* had the power of electing consuls, deciding on war, and accepting or rejecting laws. 3. The *comitia tributa*, or assemblies of the plebeian tribes only. The *tributa* were instituted not long after the expulsion of the kings, and originally transacted matters pertaining to the plebeians alone, but afterwards had wider functions, electing the inferior magistrates, etc.—BIBLIOGRAPHY: G. W. Botsford, *Roman Assemblies*; F. F. Abbott, *The History and Description of Roman Political Institutions*.

COMITY OF NATIONS (*comitas gentium*). A phrase adopted in international law to denote that kind of courtesy by which the laws and institutions of one state or country are recognized and given effect to by the Government of another. *See* INTERNATIONAL LAW.

COMMA. In punctuation, the point [,] denoting the shortest pause in reading, and separating a sentence into divisions or members according to the construction.—In music, a comma is the smallest enharmonic interval, being the difference between a major and a minor tone, and is expressed by the ratio 80 : 81.

COMMANDANT. Military officer in charge of a school, base, or fort. The word is used also for the woman at the head of organizations of women auxiliary to the forces, such as the V.A.D.

COMMAN'DER. A chief; the chief officer of an army or any division of it. The office of *Commander-in-chief* used to be the highest staff appointment in the British army. The title was sometimes changed to field-marshal commanding-in-chief, the difference being that the former was appointed by patent for life, while the latter was appointed by a letter of service, and held office during the pleasure of the sovereign. The title was abolished in 1904. In the navy, a commander holds a definite rank above lieutenant and under captain. In matters of etiquette he ranks with a lieutenant-colonel in the army. In large vessels there is a commander as well as a captain, but in many of the smaller vessels the commander is the highest officer.

COMMAN'DERY. A term used in several senses in connection with some of the military and religious orders. Among several orders of knights, as the Templars, Hospitallers, etc., it was a district under the control of a member of the order (called a commander or preceptor), who received the income of the estates belonging to the knights within that district, and expended part for his own use and accounted for the rest; in England, more especially applied to a manor belonging to the priory of the Knights Hospitallers or Knights of St. John of Jerusalem. In certain religious orders, as those of St. Bernard and St. Anthony, it was the district under the authority of a dignitary called a commander.

COMMANDITE (kom-măn-dēt). A term used in France, a partnership *en commandite* being one in which a person may advance capital without taking an active part in the management of the business, and be exempt from responsibility for more than he put into it; much the same as a limited partnership.

COMMELINACEÆ. A considerable nat. ord. of monocotyledons, mostly tropical and sub-tropical herbs with jointed stems and flat sheathing leaves. Many have handsome but fugitive blue flowers. The best-known genus is Tradescantia (q.v.).

COMMEMORATION. At the University of Oxford, the day on which the annual solemnity in honour of the benefactors of the university is held, when orations are delivered, prize compositions are read in the theatre, and honorary degrees conferred upon distinguished persons.

COMMENCEMENT. In Cambridge University, and also in the universities of the United States, the day when masters of arts and doctors receive their degrees.

COMMEN'DAM. The administrative or provisional management of a benefice during a vacancy. The person entrusted with the manage-

ment was called *commendator*. The grant of ecclesiastical livings in this way gave rise to great abuses. In England the term was applied to a living retained by a bishop after he had ceased to be an incumbent. By 6 and 7 William IV. the holding of livings *in commendam* was, for the future, abolished. In feudal law the term is applied to the practice of a freeman placing himself under the protection of a lord.

COMMENSALISM. Mutualism, association of two organisms as messmates (mutualists), to the benefit of one or both. Some brightly coloured little Australian fishes (Amphiprion) shelter within large sea-anemones (Discosoma), to which they may be thus attracted. Various crabs carry about attached anemones or sponges, the noxious properties of which serve as a protection, while the passive partner has an increased chance of securing food. Other instances are afforded by insects, e.g. certain ants which carefully tend aphides (plant lice) for the sake of a sweet fluid which these excrete. The so-called "ant-plants" exude a sugary substance that attracts ants, which in their turn repel leaf-eating insects.

COMMEN'SURABLE. A name given to such quantities or magnitudes as can be measured by one and the same common measure. The untutored mind is apt to imagine that *any* two magnitudes of the same kind must have a common measure; in other words, that, if a unit be chosen properly, the two magnitudes will both be whole number multiples of the unit. But in general this is not so, as was known to the Greek mathematicians, who showed that there is no unit, however small, which will contain both the side and the diagonal of a square an exact whole number of times.

No difficulty arises in practice from incommensurability, for all practical measurements are only approximate; lengths are measured to the nearest inch, say, or weights to the nearest ounce. In pure arithmetic the name of commensurable number is given to an ordinary vulgar fraction, which is a number commensurable with unity. Nowadays this is almost always called a *rational*, rather than a commensurable number. *See* NUMBER.

COMM'ENTARY. A term used (1) in the same sense as *memoirs*, for a narrative of particular transactions or events, as the *Commentaries* of Cæsar; (2) a series or collection of comments or annotations. These may either be in the form of detached notes, or may be embodied in a series of remarks written and printed in a connected from.

COMMENTRY (kom-mäṅ-trē). A town of France, department of Allier, 8 miles S.E. of Montluçon, in the midst of a small coal-field, which is of much advantage to the town. Pop. 10,112.

COM'MERCE. The term usually applied to the international exchange of goods as distinct from internal trade and industry. Its character, extent, and direction are determined by (1) the nature of the productive facilities in different countries; (2) internal political conditions in different countries and the state of their international relations; (3) the development of means of transport and security of trade routes; (4) freedom and facilities for exchange.

Sea-Power.—The earliest channels for commerce were rivers and sea-coasts, which provided easier and more speedy routes than the land, until the development of the railway. Nations with good harbours and a maritime population have generally been commercially important. Historically, the growth of commerce and of sea-power have been closely linked. The rise and decay of commerce in Carthage, Portugal, Spain, and Holland almost coincided with the possession and loss of maritime supremacy. The importance of ocean-borne traffic has increased immensely, but international trade by river and canal has relatively declined. The tendency is for the main lines of ocean commerce to be standardized, and independent tramp steamers to be replaced by regular cargo liners. A large part of the world's carrying trade is done by British vessels, and the excess of visible imports over exports in this country is partly due to payment for shipping services.

International Finance.—During the nineteenth century an elaborate international financial system, based on the bill of exchange, has grown up which immensely facilitates transactions between merchants in different countries. Its importance was shown by the disastrous effect of its breakdown during the European War. In Central Europe the collapse of the foreign exchanges had reduced international commerce to the slow and clumsy process of barter. By enabling countries to specialize in those goods which they can produce most easily and cheaply, commerce assists the growth of the wealth and productive power of the world, and, as a rule, of individual countries.

Free and Restricted Trade.—This is the basis of the political doctrine of

"free trade." Until the nineteenth century, however, it was generally held that the State should control commerce in the interests of national security. In the Middle Ages a rigid system of monopolies granted to associations such as the Merchant Adventurers (and later to joint stock companies such as the East India Company) was the rule, and exports and imports were strictly controlled. In the seventeenth century this policy was formulated in the mercantile doctrine that national power was more desirable than national wealth, and could be increased by regulating the balance of trade. Similar ideas led to restrictions on the commercial freedom of colonies, which were regarded as sources of profit for the mother country, and not as independent trading communities.

Past practice is parent of the modern school of thought, which holds that the conservation and development of all the natural resources of a country, irrespective of whether this is immediately profitable, increases national welfare in the long run by increasing national security and independence. Friedrich List was one of the chief exponents of these ideas in Germany, and they have been largely incorporated in modern German fiscal policy. The Tariff Reform movement in England has adopted similar doctrines. *See* TARIFF.

COMMERCE, Chamber of. A board chosen from among the merchants and traders of a city to protect the interests of commerce; to lay before the legislature the views of their members on matters affecting commerce; to furnish statistics as to the staple trade of the locality; and to attain by combination advantages which could not be reached by private enterprise, to advance and promote commercial and technical education, etc. These associations originated in France early in the eighteenth century. The first in Britain was that of Glasgow (1783); now all the great towns have their chamber. The Chambers of Commerce Association of Great Britain was incorporated in 1875. Examinations in commercial subjects instituted by the London chamber, have been a great success, including junior and senior grades, and examinations for teachers; and the movement has now spread very widely.

COMMERCIAL COURT. Although all civil courts of law except those with only special jurisdiction may try commercial cases, the name Commercial Court is, in England, given to that court which is for the time being presided over by a judge of the King's Bench Division who has special familiarity with commercial business, and to whom commercial causes have been assigned.

The court was established in London in 1895 to meet the demands of the commercial world for a simpler procedure and speedier termination. Sir J. C. Mathew was the first judge, and to him is due much of the credit of planning and establishing the court, which is now constituted also in Liverpool and Manchester.

The court works under simple rules of procedure devised by the King's Bench judges, to try causes arising out of the transactions of merchants and traders; for example, the construction of mercantile documents, the export and import of merchandise, affreightment, insurance, banking, and mercantile usages and agency. Cases are not of necessity tried in this court, but are assigned to it on application made by either party and granted by the judge. If there is a jury, it is drawn from city men. The court has been a pronounced success, and some of the best judges and counsel have been connected with it.

COMMERCIAL LAW, or **LAW MERCHANT.** The law which regulates commercial affairs among the merchants of different countries, or among merchants generally. It is derived from the different maritime codes of mediæval Europe, the imperial code of Rome, international law, and the custom of merchants. Lord Mansfield (1704-93) was the first great exponent of commercial law in Britain, and a distinguished authority was Professor Leone Levi, whose *Commercial Law of the World* led to the passing of the Acts 19 and 20 Vict. c. 60 and 97, whereby the mercantile laws of the United Kingdom were made uniform in many points. Since then considerable advance has been made towards unity of commercial legislation in foreign countries.

COMMERCIAL TERMS.

Account Current.—A periodical statement of the debit and credit transactions between parties in order of date.

Account Sales.—A statement sent by an agent to a consigner of goods when sold, giving particulars of weight, price obtained, etc., and showing the net proceeds after deduction of expenses.

Ad valorem Duty.—Duty levied in proportion to the value of the article imported.

Affidavit.—A declaration in writing upon oath.

Amortization.—The extinction or reduction of a debt by means of a sinking fund.

Audit.—An examination into accounts by proper officers appointed for that purpose.

Bank Rate.—The rate per cent. charged by the Bank of England for discounting bills.

Bear.—A person who sells stocks or shares that he does not possess at the time of selling them, but

which he hopes to buy at a lower price before the time fixed for making the delivery.

Bill of Exchange.—An unconditional order in writing addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand or at a fixed or determinable future time a certain sum in money to or to the order of a specified person or bearer.

Bill of Lading.—A receipt given by the master of a vessel for goods shipped on board his vessel.

Bill of Sale.—A document by which a person transfers his interest in goods and chattels to another.

Bill of Sight.—A custom-house entry enabling the importer to inspect goods before they are officially accepted.

Bona fide.—In good faith.

Bonded Goods.—Goods deposited in a bonded warehouse until the duties chargeable thereon are paid.

Bull.—One who purchases stock for future delivery, hoping to sell at a higher price before the time of settlement.

Charter Party.—A contract between a merchant and a shipowner.

Circular Note.—A note or bill issued by bankers for the convenience of customers travelling abroad.

Demurrage.—(1) The compensation paid to the owner of a ship for its detention by the charterer beyond the number of days allowed for loading and unloading; (2) a charge made by railway companies for detention of trucks, wagons, etc.

Docket.—To mark on the backs of letters or other documents a summary of their contents.

Draft.—A written order for the payment of a sum of money addressed to some person who holds money in trust, or who acts in the capacity of agent of the drawer.

Earnest Money.—Money paid to bind a bargain.

Ex officio.—A term denoting the power a person possesses by virtue of his office.

Indent.—An order received from a foreign correspondent.

In transitu.—In course of transmission: on the way.

Lien.—The right of a creditor to retain the property of a debtor till the debt is paid.

Limited Liability Company.—A company whose members or shareholders are liable to the extent only of the amount of the shares for which they have subscribed.

Par.—The original amount at which stocks or shares were issued. When this price rises, they are said to be at a *premium*; when the price falls below the original amount, they are said to be at a *discount*.

Per pro.—*Per procurationem.*—A document by which a person is empowered to transact the affairs of another.

Post-date. To mark (a document) with a date which is later than the day on which the document is written. A post-dated cheque or invoice does not become operative until the date marked on it.

Price of Money.—The rate of discount at which money may be borrowed.

Prime Cost.—The first or direct cost of production, before charging on cost or establishment expenses.

Pro forma.—For the esake of form.

Pro rata.—Proportionately.

Put.—In stock exchange speculation an option to deliver, or not deliver, at a future date.

Receipt.—A written acknowledgment of something having been received.

Schedule.—An inventory or catalogue of goods with prices.

Tariff.—The schedule of duties charged on the importation of merchandise into a country.

Underwriter.—In commerce one who transacts the business of marine insurance.

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COMMERCIAL TRAVELLER. The term commonly applied to the representative of a wholesale business house, who visits other traders, mostly retail, with a view to receiving orders for the goods sold by his employer or employers. According to circumstances, commercial travellers may canvass for orders only in a single town, or may have a considerable district for their field of operations, and many large firms send travellers to foreign countries.

In various foreign countries commercial travellers from other countries have to pay a considerable tax for leave to carry on their business. In Britain there are several benevolent associations for the special benefit of commercial travellers and their families, such as the Commercial Travellers' Schools for Destitute Orphans, founded at Pinner in 1845, and the Commercial Travellers' Benevolent Institution, founded in 1849 to assist old commercial travellers and the widows of those deceased. The occupation entails rather a high rate of mortality.

COMMERCIAL TREATIES. Treaties entered into between two countries for the purpose of improving and extending their commercial relations; each country engaging to abolish or to reduce to an agreed rate or otherwise modify the duties on articles of production and manufacture imported from the one country into the other. They are usually for a limited period, but may be renewed and modified according to altering conditions. In these treaties the phrase "most favoured nation" implies concessions equal to the most favourable granted under any similar treaty.

The first treaty of commerce made by England with any foreign nation was entered into with Norway in 1217. The next early English treaties are: with Flanders, 1274 and 1314; Portugal, 1308, 1352, and 1386; Baltic Cities, 1319 and 1388; France, 1471, 1497, and 1510; Florence, 1490.

Among modern treaties the most famous is that negotiated between Richard Cobden and the ministers of Napoleon III. in 1860, which resulted in benefits to both nations. Since the European War commercial treaties have become very numerous, partly as necessary preliminaries to the resumption of trade between enemy countries, partly as keys to open up new markets.

COMMERCY. A town, France department of Meuse, on the Meuse 20 miles E. of Bar-le-Duc, with iron works, etc. Pop. 8876.

COMMINATION. An office in the liturgy of the Church of England, appointed to be read on Ash Wednesday, the first day of Lent, containing a recital of God's anger and threatenings towards sinners.

COMMINES, or COMINES (ko-mēn). Two towns, one in France, the other in Belgium, on opposite sides of the Lys, 8 miles N. of Lille. In the Middle Ages they formed a single town, which was fortified and had a castle, in which Philip de Commines was born. Pop. of French Commines, 8210; of Belgian Commines, 6641.

COMMINES (ko-mēn), **Philippe de.** French writer and statesman, born 1445 at Commines, died 1509. He became confidential adviser of Charles the Bold, Duke of Burgundy, but in 1472 he passed into the service of Louis XI., who loaded him with marks of favour. After the death of Charles the Bold, Louis took possession of the duchy of Burgundy, sent Commines there, and soon after appointed him Ambassador to Florence. He was afterwards sent by Louis to Savoy, for the purpose of seizing the young Duke Philibert, and of placing him entirely under the guardianship of the king, his uncle.

In 1483 Louis XI. died, and in 1494 Commines attended Charles VIII. in his invasion of Italy, and served him in a diplomatic capacity. Soon after that date he began to write his *Memoirs*, valuable as contributions to the history of his times. He relates in them the events which occurred during his life, in very many of which he had an active share, in lively natural language, and displays everywhere a correct judgment, acute observation, and a profound knowledge of men and things. The first edition was published at Paris between 1523 and 1528. The best modern edition is that of B. de Mandrot, Paris, 1901-3. There are several English translations of the *Memoirs*. Scott in *Quentin Durward* gives an interesting picture of Commines.

COMMISSA'RIAT. The department of an army charged with the provision of supplies, both forage and food, for the troops, but not of arms and ammunition; also, the body of officers in that department. In the British army the duties of the commissariat have been managed by different bodies at different times. In 1870 the commissariat department was included in the control department; in 1875 it formed part of the commissariat and transport department; now the commissariat duties chiefly fall on the Army Service Corps; while there is an ordnance store department for the supply of the munitions of war. It is only in this latter body that there are officers designated commissaries.

COM'MISSARY. (1) An officer of a bishop who exercises spiritual jurisdiction in remote parts of a diocese, or performs the duties in the bishop's absence; (2) an officer or official of a commissariat department.

COM'MISSARY-COURT. In Scotland, a court, now abolished, which confirmed executors to deceased persons leaving moveable property in Scotland and discharged relative duties. These functions are now performed by the sheriff.

COMMIS'SION. In English law, a writ which issues from a court for various purposes, such as the taking of evidence from witnesses confined by sickness or in foreign parts. In the *army* and *navy* the writing conferring on an officer his command is his commission. In the British army previous to 1st Nov., 1871, these commissions could be purchased.

A **royal commission** in Britain is an instrument frequently issued to small bodies of persons—members of Parliament and others—empowering them to inquire into the operation of laws, into alleged grievances, or social or educational matters, etc.; generally with a view to future legislation. Their proceedings are recorded and usually issued in the form of a report.

A **commission agent** is one who sells goods on behalf of another, being paid by a certain percentage which is called his *commission*.

In ordinary language *commission* is a percentage paid to an agent or intermediary in a pecuniary affair or business.

COMMISSIONAIRE. One of a body of public messengers in Britain originally selected from the wounded soldiers of the Crimean and Indian Wars. They receive their appointment from a society established by Captain Sir Edward Walter in 1859. They are established in most of the great cities, and their charges are regulated by a tariff. In 1933 there were 4800 members of the corps. Its headquarters are at 419A Strand, London, W.C.

COMMISSIONERS OF POLICE. One of the persons elected to manage the affairs of a police burgh or noncorporate town in Scotland, corresponding to a bailie or town councillor in a corporate town.

COMMISSIONERS OF SUPPLY. In Scotland, commissioners appointed to assess the land tax and to apportion the valuation according to the Valuation of Lands Act. Their powers and duties are now mostly transferred to county councils.

COM'MISSURE. In anatomy, a structure linking together parts of the body, most commonly applied to nerve fibres co-ordinating the activities of the two sides of the central nervous system, as the *corpus callosum* or *great commissure* of the brain.

COMMIT'TEE. One or more persons elected or appointed to attend to any matter or business referred to them either by a legislative body, or by a court, or by any corporation, or by any society or collective body of men acting together. In Parliament, when a committee consists of the whole members of the body acting in a different capacity from that which usually belongs to them it is called a *committee of the whole House*, the business of which is conducted under somewhat different regulations from those under which the business of the House when not in committee is carried on.

Familiar examples of committees of the whole House are *committees of supply* and *committees of ways and means*. The functions and duties of the former relate to the expenditure of the nation, and those of the latter to the funds by which such expenditure is to be sustained.

Standing committees are such as continue during the existence of Parliament, and to these are committed all matters that fall within the purposes of their appointment, as the committee of elections or of privileges, etc.

Select committees are appointed to consider and report on particular subjects.

COMMITTEE OF PUBLIC SAFETY (*Comité du Salut Public*). A body elected by the French Convention (6th April, 1793) from among its own members, at first having very limited powers conferred upon it—that of supervising the executive and of accelerating its actions. Subsequently, however, its powers became extended; all the executive authority passed into its hands, and the ministers became merely its scribes. It was at first composed of nine, but was increased to twelve members, viz. Robespierre, Danton, Couthon, St.-Just, Prieur, Robert-Lindet, Hérault de Séchelles, Jean-Bon St.-André, Barrère, Carnot, Collot d'Herbois, and Billaud-Varennes.

The severe government of this body is known as the Reign of Terror, which ended with the execution of Robespierre and his associates in July, 1794. During the Commune (March to May, 1871), a similar committee was established in Paris. A Committee of Public Safety was established in Russia during the revolution of 1917.

COM'MODORE. In the British navy, an officer, generally a captain, holding a temporary commission with a rank between that of captain and admiral, who commands a ship or detachment of ships in the absence of an admiral. They are of two kinds—one having a captain under him in the same ship, and the other without a captain. The former has the rank, pay, and allowance of a rear-admiral, the latter the pay and allowance of a captain, with a special allowance as the Admiralty may direct. They both carry distinguishing pennants. There is a similar rank in the United States navy. The title is also given to the senior captain of a line of merchant vessels, and also to the president of a yachting club.

COM'MODUS, L. Ælius Aurelius. A Roman emperor, son of Marcus Aurelius, was born A.D. 161, killed 192. Having succeeded his father in 180, he gave early proofs of his cruel and voluptuous character, indulging in the lowest pursuits and the most shameless habits. He used to fight in the circus like a gladiator, and caused himself to be worshipped as Hercules. One of his concubines, whom he intended to put to death, administered poison to him; but it operated too slowly, and he was strangled by a favourite athlete. A statue of Commodus was dug up at Rome in 1874.

COM'MON. In English law, "a profit which a man hath in the land of another." There are certain rights of common recognized by the common law of England, namely, of *pasture*, of *piscary* or fishing, of *estovers* or cutting wood, and of *turbary* or of digging turf. But the phrase usually means the right of pasturing cattle, horses, etc., in a certain field, or within a certain territory. These rights, in England, have been mostly determined by prescription or immemorial usage. In ordinary language a common is a piece of ground which has no single owner but belongs to a community generally, often unenclosed. A large number of commons have been enclosed under local Acts of Parliament.

COMMON CARRIERS. *See* CARRIER.

COMMON COUNCIL. The council of a city or corporate town, empowered to make by-laws for the government of the citizens. The common councils sometimes consist of two houses, chambers, or courts, and sometimes form only one. Thus the common council of London consists of two houses, the upper house, composed of the lord mayor and aldermen, and the lower house of the common council men, who are elected annually.

COMMON LAW. The unwritten law, the law that receives its binding force from immemorial usage and universal reception as distinguished from the written or statute law; sometimes from the civil or canon law; and occasionally from the *lex mercatoria*, or commercial and maritime jurisprudence. It consists of that body of rules, principles, and customs which have been received from former times, and by which courts have been guided in their judicial decisions.

The evidence of this law is to be found in the reports of those decisions and the records of the courts. Some of these rules may have originated in edicts or statutes which are now lost, or in the terms and conditions of particular grants or charters; but it is quite certain that many of them originated in judicial decisions founded on natural justice and equity, or on local customs. It is contrasted with (1) the statute law contained in Acts of Parliament; (2) equity, which is also an accretion of judicial decisions, but formed by a new tribunal, which first appeared when the common law had reached its full growth; and (3) the civil law inherited by modern Europe from the Roman Empire. Wherever statute law, however, runs counter to common law, the latter is entirely overruled; but common law, on the other hand, asserts its pre-eminence where equity is opposed to it.

COMMON PLEAS, Court of. Formerly one of the three superior courts of common law in England, presided over by a lord chief justice and five at an earlier period four) puisne judges, and having cognizance of all civil causes, real, personal, or mixed, as well by original writ as by removal from the inferior courts. It was a development of the *Curia Regis*, or Great Council of the Realm of Norman times. By the Judicature Act, 1873, the jurisdiction of the common pleas was vested in the King's Bench Division of the High Court of Justice.

COMMON PRAYER, Book of. The liturgy or public form of prayer prescribed by the Church of England to be used in all churches and chapels, and which the clergy are to use under a certain penalty. The *Book of Common Prayer* is used also by the English-speaking Episcopal Churches in Scotland, Ireland, America, and the colonies, as well as by some non-episcopal bodies, with or without certain alterations.

It dates from the reign of Edward VI.; was published in 1549, and again with some changes in 1552. Some slight alterations were made upon it when it was adopted in the reign of Elizabeth. In the reign of James I., and finally soon after the Restoration, it underwent new revisions. In 1872 and 1879 some slight changes were made, and in 1904 a Royal Commission was appointed. As a result of its findings the business of discussing the revision of the Prayer Book was begun.

By the Establishing Act of 1919 the National Assembly of the Church was set up. The Revised Prayer Book (Permissive Use) Measure was passed by the Assembly in 1923, and in 1927 the "Book referred to in the Prayer Book Measure, 1927," was finally approved. Passed by the House of Lords in Dec., 1927, the Measure was rejected by the Commons in 1927 and 1928.

COMMONS, House of. In Great Britain and Canada the name given to the House of Parliament elected directly by the people. In England the House began in the fourteenth century, when the representatives of the counties and boroughs separated themselves from the lords, and were called the commons. They had little power at first, but gradually asserted themselves. Their present power is due mainly to their control of finance, finally established by the Parliament Act of 1911. For practical purposes the House of Commons is omnipotent in legislation. In Canada the Senate is more of a check than is the House of Lords in England.

The number of members in the English House of Commons was at one time 670, but since the establishment of the Irish Free State it has been 615. Women have been eligible for election since 1918. England elects 492 members; Wales 36; Scotland 74; and N. Ireland 13. London sends 62 members, and 12 are sent by the universities. The President of the House is the Speaker; his deputy is the Chairman of Committees. The control of business is in the hands of the Prime Minister and his assistants. Ministers and their followers sit on the Speaker's right; members of the Opposition on his left. The Canadian House of Commons consists of 245 members, and

its procedure is modelled on that of the British house.

COMMON SENSE. The philosophy of the so-called Scottish school of philosophy founded by Thomas Reid (1710-96), who aimed to establish a series of fundamental truths indisputable as primitive facts of consciousness. He taught that the general consent of mankind as to the existence of an external world, as to the difference between substance and qualities, between thought and the mind that thinks, is sufficient to establish the reality of a permanent world apart from ourselves: and he maintained that sensations are not the objects of our perception.

COMMON TIME. In music, that in which every bar contains an even number of sub-divisions, such as two minims, four quavers, or their equivalents. It is of two kinds, simple and compound. Simple common time is that which includes four beats in a bar, or any division of that number, or square of the number or its divisions. Compound common time includes two or four beats of three crotchets or quavers to each beat.

COM'MONWEALTH. The whole body of people in a State; the body politic. In English history the name given to the form of government established after the death of Charles I., and which lasted until the restoration of Charles II. (1649-60). The Commonwealth of Australia is the title of the federation of Australian colonies carried out in 1900.

British Commonwealth of Nations is a current term used in preference to British Empire.

The **Commonwealth Fund** is an American benefaction due to Mrs. S. V. Harkness. By it British students can spend two years at American universities. There are 38 fellowships, each worth £600 a year.

COM'MUNALISM. The theory of government which advocates complete local autonomy for towns and other definable communities, the central government being replaced by a federating authority. The theory was adopted by the advanced Republicans of France and elsewhere, especially in 1870-71. They held that every commune, or at least every important city commune, as Paris, Marseilles, Lyons, etc., should be a kind of independent state in itself, and France merely a federation of such states. This doctrine has to a large extent been displaced by syndicalism, which contemplates autonomy of trades and occupations.

Being concerned with the machinery of government, it must be distinguished from communism, which primarily regards economic rights. Historically, however, the two are closely allied.

COM'MUNE. A small territorial district in France, being one of the subordinate divisions into which that country is parcelled out; the name is also given to similar divisions in some other countries, as Belgium. In the country a commune sometimes embraces a number of villages, while some large cities are divided into a number of communes. In either case each commune is governed by an officer called a mayor. In feudal times the term was applied to a body of burgesses holding a charter granting them certain privileges of self-government.

COMMUNE OF PARIS. 1. A revolutionary committee which took the place of the municipality of Paris in the French revolution of 1789, and soon usurped the supreme authority in the State. Among its chiefs were some of the most violent of the demagogues, such as Hébert, Danton, and Robespierre.

2. The name adopted by the ultra-radical party in Paris brought once more into prominence by the events of the Franco-Prussian War, more immediately by the siege of Paris (Oct., 1870, to Jan., 1871). They ruled over Paris for a brief period (from 18th March to 28th May, 1871) after the evacuation of the German troops, and had to be suppressed by troops collected by the National Assembly of France. The rising was entirely political and confined to Paris; it was based on no well-defined dogmas, only a fractional part of the communal government being communists in the economic sense and these were soon thrust aside by their more violent and unscrupulous comrades. Much bloodshed and wanton destruction of property took place before the rising was put down by M. Thiers' Government.

As they intended to replace the central national organization by one based on a federation of communes the communists were also called "federalists."—BIBLIOGRAPHY: P. O. Lissagaray, *Histoire de la Commune* (English translation by Aveling); J. Leighton, *Paris under the Commune*; E. Belfort Bax, *The Commune of Paris*.

COM'MUNISM. The economic system or theory which upholds the absorption of all proprietary rights by the community, and the equal division of labour and income among its members. Equality is taken to mean "from each according to his ability, to each according to his need

No communistic society has as yet been successful. Robert Owen and Étienne Cabet made several experiments in modified communism, but they failed.

St. Simon, Fourier, and Proudhon, often regarded as communists, are not really so, as their theories are not based on the principle of equality. L. A. Blanqui (1805-81) was an uncompromising advocate of communism. Communism must be distinguished from collectivism, which holds that the community should own all the means of production, and itself carry on production. Bolshevism (q.v.) is merely communism put into practice. Communism is very strong in Finland, and there is a good deal of it in China.

There is a **Communist Party** in Great Britain, with an organization at 16 King Street, Covent Garden, London, W.C.2. It holds an annual congress, and at the general election of 1931 its candidates received 75,000 votes.—BIBLIOGRAPHY: A. Sudré, *Histoire du Communisme*; Kautsky, *Communism in Central Europe, etc.*; C. Nordhoff, *The Communistic Societies of the United States*; R. W. Emerson, *Reminiscences of Brook Farm.*

COMMUTATION. Process of exchanging one thing for another. Its most common use is for the payment of a sum of money to discharge a recurring obligation. Thus, a person who owns land subject to the old Land Tax can commute it by making a single payment. Sometimes the State, instead of paying a pension, indefinitely pays a sum of money to close its liability. The commutation of tithe means the change of one-tenth of the produce of the land into a fixed sum of money each year, under the Tithe Commutation Act of 1836.

COMMUTATOR. Device in a dynamo by which an alternating current is converted into a continuous one.

COMNE'NI. An extinct family of sovereigns, statesmen, generals, and authors, said to be of Roman origin, to which belonged, from 1057 to 1185, six emperors of the East; Isaac I., Alexis I., John II., Manuel I., Alexis II., and Andronicus I. When the Crusaders had overturned the throne of the Comneni in Constantinople, a prince of that House founded an independent state at Trebizond, in Asia Minor, where he was Governor (1204). The last sovereign of this House was David Comnenus (1461). A remarkable member of the family was the Princess Anna Comnena. *See* ANNA COMNENA.

COMO (ancient **Comum**). Capital of the province of Como, in the north of Italy (Lombardy), 24 miles N.N.W. of Milan, in a delightful valley at the south-west extremity of Lake Como. It has a splendid marble cathedral dating from the fourteenth century, the old church of S. Fedele of the tenth century, the town hall finished in 1215, the fine theatre built in 1813. Here were born Pliny the elder and younger, and Volta the natural philosopher. Pop. 48,699.—The province of Como has an area of 798 sq. miles, and a pop. of 486,982.

COMO, Lake of (Lago di Como, anciently **Lacus Larius).** A lake in the north of Italy, at the foot of the Alps, fed and drained by the River Adda, which carries its surplus waters to the Po. It extends from south-west to north-east 30 miles, giving off towards the middle, at the promontory where stands Bellagio, a branch running for about 13 miles S.E. to Lecco, called the Lake of Lecco; greatest width, 2½ miles; greatest depth, 1929 feet. It is celebrated for the beautiful scenery of its shores, which are covered with handsome villas, gardens, and vineyards, mountains rising behind to the height of 7000 feet. Trout and other fish abound in the lake.

COMORIN'. A cape forming the south extremity of India (lat. 8° 4′ N., long. 77° 35′ E.) and consisting of a low sandy point.

COM'ORO ISLANDS. A volcanic group in the India Ocean, between the northern extremity of Madagascar and the continent of Africa. They are four in number: Great Comoro, Moheli, Anjouan, and Mayotte; total area, 790 sq. miles; pop. 119,305. The people are nominally Mahommedans, and are akin to the mixed races of Zanzibar. They have large flocks and herds; and the coast lands are very fertile, abounding in tropical grains and fruits.

Mayotte belonged to France since 1843, and in 1886 the others became a French possession. By a law of 1912 and a decree of 1914 the whole archipelago became a French colony, attached to the general government of Madagascar, of which it forms a twenty-third province, the "Province des Comores."

COMPAN'ION. A raised hatch or cover to the cabin stair of a merchant vessel.—**Companion Ladder,** the steps or ladder by which persons ascend to and descend from the quarter-deck.

COMPANION OF HONOUR. British order. Instituted in 1917, it is limited to 50 members, and is conferred for conspicuous national service. Companions use C.H. after their names. The badge, a plaque

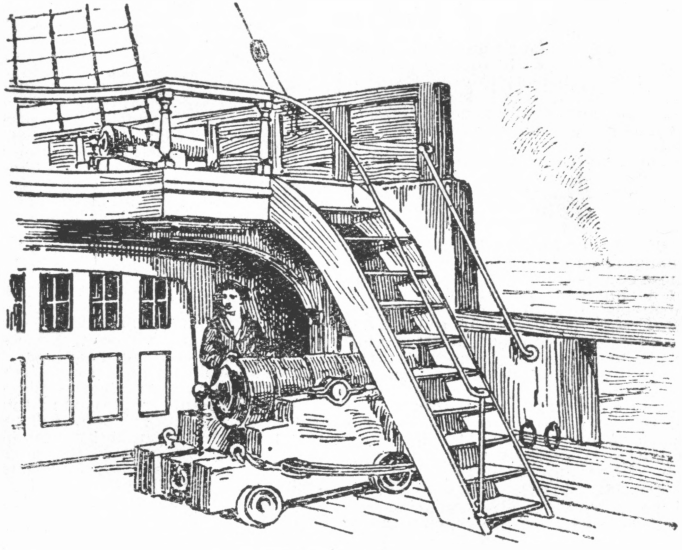
with mounted knight, and an oak-tree supporting the Royal Arms, centres an enamelled blue oval bearing the motto "In action faithful and in honour clear," affixed to a crown suspended on a gold-edged carmine ribbon.

COMPANY. Association of persons for trading. Trading companies existed in England in Elizabethan times, and some became chartered companies. The East India Company was a company of this kind.

An Act of 1862 allowed a body of traders to form themselves into a company with limited liability. In 1908 the law was consolidated, and a new class of company created. These are private companies enjoying the protection of the limited liability system; but they cannot offer their shares to the public, nor can they have more than 50 shareholders. In 1928 a new Companies Act provided, among other things, that directors must give more information to shareholders in the balance sheets.

COM'PANY. In military language, a sub-division of an infantry battalion, corresponding to a troop of cavalry or a battery of artillery. The double-company, introduced in 1914, consists of 220 men, and is commanded by a major or mounted captain. *See* ARMY.

COMPARATOR. An instrument for comparing lengths. In its best known form it served the purpose of obtaining metre rules of the same length as the standard metre. The comparator employed by the International Bureau of Weights and Measures (Paris, 1881) to compare the international standard metres consisted essentially of two measuring microscopes placed at a horizontal distance of one metre, and capable of displacement through short measurable distances by means of fine graduated screws. The microscopes having been set for the standard bar, a second bar was substituted, and if it were longer or shorter than the standard, the difference in length was obtained from the displacement of the fine screw required to give optical coincidence with the end of the bar.



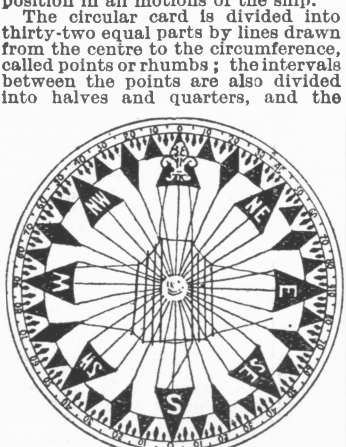
Companion Ladder
From a model in the Royal Naval College, Greenwich.

COMPASS. An instrument used to indicate the magnetic meridian or the position of objects with respect to that meridian, and employed especially on ships, and by surveyors and travellers. Its origin is unknown, but it is supposed to have been brought from China to Europe about the

middle of the thirteenth century. As now generally used it consists of three parts, namely, the box, the card or fly, and the needle—the last being the really essential part, and consisting of a small magnet so suspended that it may be able to move freely in a horizontal direction.

The box, which contains the card and needle, is, in the case of the common **mariner's compass,** a circular brass receptacle hung within a wooden one by two concentric rings called gimbals, so fixed by the cross centres to the box that the inner one, or compass-box, shall retain a horizontal position in all motions of the ship.

The circular card is divided into thirty-two equal parts by lines drawn from the centre to the circumference, called points or rhumbs; the intervals between the points are also divided into halves and quarters, and the



Compass Card

whole circumference into equal parts r degrees, 360 of which complete the ircle; and, consequently, the dis- ance or angle comprehended between ny two rhumbs is equal to 11¼°. The our principal are called cardinal oints: viz. North, South, East, nd West. The names of the rest re compounded of these.

The needle is a small bar of magnet- ed steel. It is fixed on the under de of the card, and in the centre is aced a conical socket, which is oised on an upright pointed pin ted in the bottom of the box; so at the card, supported on the pin, rns freely round its centre, and, nder the influence of the earth's agnetic force upon the needle, the rth point marked on the card is rected towards the magnetic north. ie needle, however, is liable to devia- on from the magnetic meridian ing to the magnetism of the ship, particularly in the case of iron ships. *See* DEVIATION.

Important improvements in the mariner's compass were devised by Lord Kelvin. In particular, the single needle was replaced by eight exceedingly small needles placed parallel to one another, and attached by silk threads to the aluminium rim which encircles the outer edge of the card. By this means extreme lightness and a minimum of friction on the pin are secured. In the compass used by land-surveyors and others the needle is not fixed to a card, but is suspended alone, the points being marked on the bottom of the box. *See also* GYRO-COMPASS.—BIBLIOGRAPHY: A. P. W. Williamson, *Magnetism: Deviation of the Compass and Compass Adjustment*; Anschütz & Co., *The Anschutz Gyro-compass*; S. P. Thomson, *The Rose of the Winds; the Origin and Development of the Compass Card*; Admiralty Manual: *Deviations of the Compass.*

COMPASSES, or **PAIR OF COMPASSES.** A mathematical instrument used for the describing of circles, measuring lines, etc. They consist simply of two pointed legs, movable on a joint or pivot, and are used for measuring and transferring distances. For describing circles the lower end of one of the legs is removed, and its place supplied by a holder for a pencil or pen.

Hair compasses are compasses having a spring tending to keep the legs apart, and a finely-threaded screw by which the spring can be compressed or relaxed with the utmost nicety, and the distance of the legs regulated to a hair's-breadth.

Bow compasses are compasses having the two legs united by a bow passing through one of them, the distance between the legs being adjusted by means of a screw and nut.

Proportional compasses are compasses used for reducing or enlarging drawings, having the legs crossing so as to present a pair on each side of a common pivot. By means of a slit in the legs, and the movable pivot, the relative distances between the points at the respective ends may be adjusted at pleasure in the required proportion.

COMPASS PLANT (*Silphium laciniātum*). A composite plant growing in the prairies of the Mississippi Valley, and remarkable from the fact that its erect radical leaves stand so that their edges point almost exactly north and south, especially in midsummer, thus escaping the intense midday radiation. The prickly lettuce (*Lactuca Scariola*) behaves in the same way.

COMPENSATED BALANCE-WHEEL, or PENDULUM. A balance-wheel or a pendulum so constructed as to counteract the tendency of variations of temperature to produce variations in the rate of vibration or oscillation. This may be accomplished in various ways, as by bars formed of two or more metals of different expansibilities, so that the expansion of one counteracts the expansion of another. They are used to produce perfect equality of motion in the balances of watches and chronometers and the pendulums of clocks. The necessity for compensation is to some extent removed by the discovery of alloys, such as invar, which have extremely small expansibility.

COMPENSATION. This is a term applied in both English and Scottish Law to money payments made in respect of the compulsory acquisition of lands by Government Departments, Public or Local Authorities, public undertakings and others, pursuant to Act of Parliament, e.g. for the construction of railways, harbours, docks, or waterworks, the making and widening of roads, and other purposes of a public nature.

Prior to 1845 it was the custom to incorporate in the Special Act applying to each particular body or undertaking, provisions regulating the acquisition of lands for the purposes of the body or undertaking, and the mode of assessing the compensation payable in respect of the compulsory surrender of the lands. It was found, however, that this was a wholly unsatisfactory method—not merely on account of the unnecessary expense involved in the repetition, with little variation, of clauses commonly inserted in each Special Act, but also on account of the attempts made on almost every occasion to obtain modifications in, or amplifications of, the terms of these clauses. The result was that in 1845, for the purpose of establishing one general authority regulating the compulsory acquisition of lands for objects of a public or quasi-public nature, and the payment of compensation, the Lands Clauses Consolidation Act was passed.

The usual practice is as follows. The purchasing undertaking serves upon the owner and all others interested (e.g. tenants, mortgagees, etc.) a notice—popularly known as a "notice to treat"—that it intends to take over the lands or a specified portion of them. The parties may agree upon the extent of the property to be surrendered and the compensation to be paid. If, however, the owner objects to the acquisition of less than the whole of the particular subjects, he must take the precaution of replying with a counter-notice. As a general rule, he is not bound against his will to part only with a portion of a house, manufactory, or other building, and may require the whole to be taken over.

Compensation may be awarded to him not only in respect of the actual subjects transferred, but also in respect of the diminished value of the residue occasioned by the severance, where such takes place. If agreement is not reached on the amount of the compensation, it may be determined by the justices, by the sheriff, by a jury, or by arbitration.

The Acquisition of Land (Assessment of Compensation) Act, 1919, establishes a panel of official arbitrators for assessing the compensation to be made for land compulsorily acquired by a public authority for public purposes, abolishes the practice of awarding an additional allowance or bonus (which usually varied from 10 to 30 per cent. of the price) on account of the compulsory acquisition, and, generally speaking, takes the value to be the amount which the land would realize if sold in the open market by a willing seller. Tenants of agricultural property are entitled on leaving to compensation for any improvements made by them, and since 1927 tenants of business premises have had a similar right. Compensation can be obtained also if a person or his property is injured while travelling in a public vehicle.

The term **compensation** is also applied to payments made by public authorities for damage done to property by riot or civil commotion; to payments to workmen for injuries sustained in the course of their employment (*see* EMPLOYERS' LIABILITY; WORKMEN'S COMPENSATION); to the damages paid in certain circumstances to owners of property on the non-renewal of their tenants' licences, equivalent to the difference between the value of the property as licensed and the value as unlicensed; and to the payments due to the tenant of a holding under the Agricultural Holdings Act at the determination of his tenancy in respect of improvements, disturbance, unexhausted manure, etc.

In Scotland the term denotes the extinction in whole or in part of the mutual obligations where two parties are each in the position of creditor and debtor to one another. The parties must stand as creditor and debtor to each other in the same capacity, e.g. a trustee cannot compensate a debt due by him personally by a debt due to him as trustee. Compensation is impossible between

a debt due to a partnership and a debt due by a partner, but there may be compensation between a debt due by a partnership and a debt due to a partner, because a partner is not a creditor in debts due to the firm, but is a debtor in debts due by the firm.

Further, both debts must be liquid, that is, unconditional and either admitted or constituted in such a form, e.g. by decree, that diligence can at once proceed against the debtor's property. If, however, the creditor in a liquid debt becomes bankrupt his debtor, if creditor in an illiquid debt, may withhold payment until his debt is constituted and then plead compensation. A similar right arises where two claims, one liquid and the other illiquid, arise in respect of the same contract, as when a carrier's demand for freight is met by a claim for damages to the goods.

The **Compensation Fund** is a fund raised from the owners of public-house licences. It is used to compensate those whose licences are taken away, except in cases of misconduct.

COMPETITION. The rivalry for a position of supremacy; the striving of different collectivities or individuals to obtain the goal which they consider as advantageous. Life itself and the struggle for existence, resulting in the survival of the fittest, is, therefore, competitive. It is "the free action of individual self-interest," whereby the strongest gets most and the weakest least. Competition thus exists everywhere where one man vies with another for the advantage of dealing with a third party. The term, however, is usually restricted to political economy, and means rivalry in supplying an economic demand.

Economically competition has been considered as good and advantageous for the consumer. Just as in the universal conflict, in the struggle for life, the competition of individual interests results in the survival of the fittest, eliminating the inferior types and perfecting the stronger, so in economic life competition acts as an agent of natural selection for the benefit of the masses.

Thus economists have sung the praises of competition, especially the Manchester school and the followers of the principle of *laisser faire*. Competition, they said, is not only the inherent law of industry and of commerce, but by creating rivalry between the employers it compels them, in order to avoid bankruptcy and industrial failure, to increase the wages of the employed. Competition, therefore, is to the advantage not only of the consumer, but also of the labourer. It is a stimulus for man to work hard, and society can only benefit by the hard work of its members.

Socialism, on the other hand, considers free competition as the root of many an evil, and claims State interference, restriction, and an orderly distribution of the common wealth by the State. Free competition does not result in a natural but in an artificial survival of the fittest, as it is not always the best but the least scrupulous who succeeds. Socialists also point out, and perhaps logically, that free competition invariably leads to the very suppression of the freedom to compete. Competitors, as a rule, do not start fair, as there is no equality of opportunity, and the ultimate result is the establishment of gigantic trusts and syndicates, and the disappearance of the smaller concerns. Unable to compete against a more powerful enemy, the smaller man, equally good, if not better, is doomed to failure.

At first the consumer benefits, perhaps, by this competition, but once the trusts have succeeded in their enterprise, the costs of the products increase. Socialism, however, does not take into consideration the individual initiative which alone, according to the individualists, is responsible for progress. Although in recent times Governments have introduced restrictive laws intended to protect home industries, whilst tariff laws and prohibition of importation are calculated to put a stop to competition between nations, it is nevertheless a fact that for many years free competition will be at the basis of economic activity both in Western Europe and in America. That absolute State interference would be detrimental to the economic life of Europe, the failure of the economic policy of Soviet Russia has amply proved. *See* ECONOMICS; TRUSTS.

COMPIÈGNE (kōn-pyăn). A French town, department of Oise, on the left bank of the Oise, 45 miles N.N.E. of Paris. It has a splendid château, built by St. Louis, rebuilt by Louis XIV., and improved by Louis XV., Louis XVI., and Napoleon I. It was the autumn resort of the Court of Napoleon III. In 1430 Joan of Arc was taken prisoner here by the English. During the European War the battle of Compiègne-Néry was fought on 1st Sept., 1914, and on 8th Nov., 1918, Marshal Foch presented the Allies' armistice terms to the German delegates in the forest of Compiègne. Pop. 17,852.

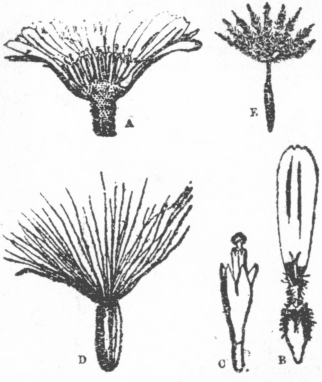
COMPLEXION. The colour or hue of the skin, particularly of the face. The colour depends partly on pigment

in the deep cells of the epidermis and partly on the blood supply. The nature and colour of the hair seems closely connected with the complexion, and these combined are important distinguishing marks of different races. *See* ETHNOLOGY.

COM'PLINE. The last of the daily canonical hours in the Roman Catholic breviary; technically 9 p.m., but usually combined with Vespers or evening office.

COMPLUTENSIAN POLYGLOT. A celebrated polyglot edition of the Bible published at Complutum, the ancient name of Alcalá de Henares, in Spain, 1514-22, by Cardinal Ximenes.

COMPOS'ITÆ. The largest known nat. ord. of plants, containing over

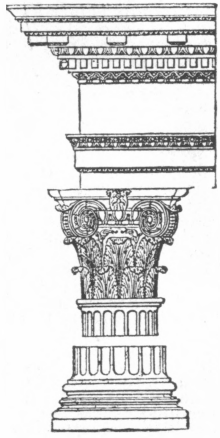


Compositæ

A, Vertical section of capitulum of Marigold. B, Ligulate, and C, tubular florets of the same. D, Achene and simple pappus of *Senecio*. E, Achene and feathery pappus of *Tragopogon pratensis*.

12,000 described species of herbs or shrubs, about ten per cent. of all flowering plants, distributed all over the world. The flowers (called *florets*) are numerous (with few exceptions) and sessile, forming a close head or *capitulum* on the dilated top of the receptacle, and surrounded by an *involucre* of whorled bracts. The flowers are gamopetalous, and the order is divided into two natural groups from the form of the corolla: (1) *Tubuliflōræ*, in which the central or disc florets, at least, are tubular, with five, rarely four, teeth; (2) *Liguliflōræ*, in which all the florets are slit or ligulate. The calyx is suppressed, its protective rôle being assumed by the involucre enclosing the whole inflorescence. The stamens are inserted on the corolla, and their anthers are united into a tube (*syngenesious*). The style is two-cleft at the apex. The fruit, which arises from an inferior ovary, is dry and seed-like, and generally bears a parachute-like tuft of hairs (*pappus*) for wind-dispersal, well seen in the familiar dandelion "clock." The head of numerous florets was called by the older botanists a compound flower, hence the name. Many are common weeds, like the daisy, dandelion, thistle, etc.; or are cultivated in gardens, such as the asters, marigold, etc.; others have some economic or medicinal value, as chicory, artichoke, chamomile, lettuce, wormwood, arnica, etc.

COMPOSITE ORDER. In architecture, the last of the five orders;



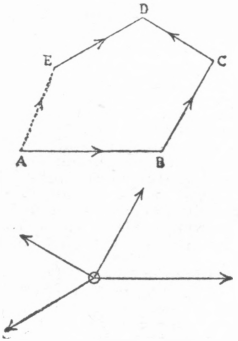
Composite Order

so called because the capital belonging to it is composed out of those of the other orders, borrowing a quarter round from the Tuscan and Doric a row of leaves from the Corinthian and volutes from the Ionic. Its cornice has simple modillions or dentils. It is called also the *Roman* or the *Italic* order.

COMPOSITION. An arrangement which a bankrupt or person in pecuniary difficulties makes with his creditors, and by which he arranges to pay them a certain proportion on of the debts due. *See* BANKRUPT.

COMPOSITION OF FORCES AND VELOCITIES. In mechanics, the arrangement whereby a system of several forces or velocities may be replaced by a single equivalent for

or velocity called the *resultant*. If the straight lines AB, BC, CD, etc., be drawn end to end parallel and proportional to forces or velocities at a point O, the straight line AE



which closes the polygon represents the resultant to scale. If the forces do not act at a point, they are equivalent to a single force and a couple.

COMPOSTELLA. *See* SANTIAGO-DE-COMPOSTELLA.

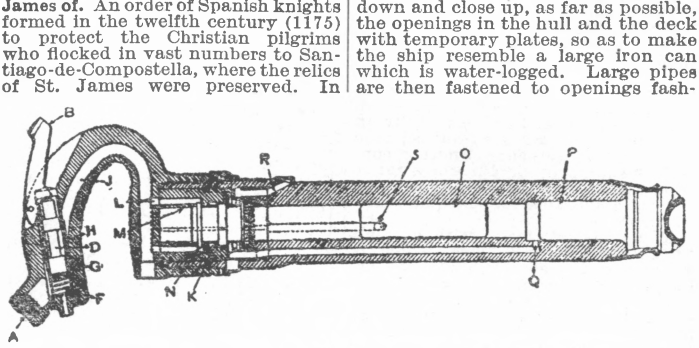
COMPOSTEL'LA, Order of St. James of. An order of Spanish knights formed in the twelfth century (1175) to protect the Christian pilgrims who flocked in vast numbers to Santiago-de-Compostella, where the relics of St. James were preserved. In time they attained great wealth, thereby exciting the jealousy of the Crown, which succeeded in securing the grand-mastership in 1522, whereupon the order rapidly declined.

COMPOUND ANIMALS. Animals, many of which by no means belong to the lowest types, in which individuals, distinct as regards many of the functions of life, are yet connected by some part of their frame so as to form a united whole. Hydroid zoophytes, most corals and polyzoa, and some ascidians are of this nature.

COMPOUNDING OF FELONY. The accepting of a consideration for forbearing to prosecute; or the agreeing to receive one's goods again from a thief on condition of not prosecuting. This is an offence punishable by fine and imprisonment.

COMPRESSED AIR. Used industrially for many purposes. The air may be used at a high pressure (100 to 5000 lb. per square inch, say), or at a low pressure (15 to 20 lb. per square inch, say). Pneumatic tools work with air at about 80 lb. per square inch.

Low-pressure air is used in the salving of ships, the construction of caissons, tunnels, etc., and with furnaces. In the salving of ships the use of compressed air is particularly applicable in shallow water. Divers go down and close up, as far as possible, the openings in the hull and the deck with temporary plates, so as to make the ship resemble a large iron can which is water-logged. Large pipes are then fastened to openings fash-



The illustration shows the "New Boyer" Riveting Hammer, made by the Consolidated Pneumatic Tool Co. Ltd., Fraserburgh. The air-pipe is attached to the head at A. The throttle-valve D is normally kept closed by the spring F, but when it is opened by pressure on the trigger B, the ports G are uncovered, and the compressed air flows through G and H into the passage J. The hammer-valve K is moveable. It is shown in its forward position. The air flows through J into the groove L, thence through a number of ports and the groove M in the valve-case M into the cylinder, where it acts on the rear end of the piston O, driving it forward to strike the working tool, or snap, P. The space in front of the piston is, during this part of the stroke, in communication with the atmosphere through the ports Q and R. As soon as the rear end of the piston has uncovered the port S, air from the cylinder flows through and moves the hammer-valve backwards, cutting off the air-supply to the back of the piston, but opening a way for it to the front, so that the piston is driven backwards. The space between piston and handle is, during this back-stroke, in communication with the atmosphere, until the rear end passes a certain point. When this point is reached, the hammer-valve K is pressed forwards, air enters the cylinder again through the groove N, and another forward stroke begins. The hammer, working at 80 lb. to 100 lb. pressure, gives about 1000 blows per minute.

ioned in any suitable place and manner, and air is blown into the ship. The water in the ship is blown out through vents left for this purpose, with the result that the ship recovers buoyancy and rises. Care has to be taken that too great an air-pressure is not used. When the deck passes through the surface of the water, it experiences the full pressure of the air, which may be sufficient to burst it. Comparatively low pressures (25 to 30 lb. per square inch) might cause trouble in this way. Though simple in principle, the operation of salving a wreck in this way is one calling for much engineering resource and endurance, and may take months to accomplish. The work is often undertaken by adventurous companies, who are paid handsomely if their work is successful.

In the construction of tunnels and submerged caissons, compressed air is used to prevent the inrush of water into the working space. The men are then let into and out of the working space through " air-locks." Working in compressed air for prolonged periods causes a painful disease called " caisson disease." It is caused by nitrogen getting into the blood.

In blast-furnaces the blast is usually supplied at about 10 to 15 lb. per square-inch pressure.

In all these instances the compressed air is supplied by large " blowing engines," which are simply bicycle pumps on a large scale. They are driven usually by steam-engines.

High-pressure air is used for working pneumatic tools, such as riveting hammers, caulking tools, etc.; small machines; rock drills, especially in the South African gold-mines; the propulsion of torpedoes and the control of submarines. Pressures range from about 80 lb. per square inch for tools to about 4000 lb. per square inch in torpedoes.

The tools are made with a small pneumatic engine in them, which is worked by the air much as a steam-engine is by steam.

In torpedoes a space in the middle of the torpedo is used as a reservoir, and is filled with highly compressed air (at about 4000 lb. per square inch). Aft of the reservoir is an air-engine, which works the tail propellers of the torpedo. When the torpedo is " fired," it is blown out of the " torpedo tube " by compressed air, and the supply of air to the torpedo engine is automatically started. After the torpedo " takes the water," it is propelled by the energy of the air stored in it, which is sufficient to give it a range of about 7 miles at a speed of 35 to 40 knots.

The compressed air is also used to expel water from the ballast-tanks. Along the bottom of the submarine is a series of tanks communicating with the sea through sea-cocks. When the submarine submerges, these are wholly or partially flooded. To rise, the water in these tanks is expelled by means of compressed air. The compressed air is stored in bottles at very high pressure, and part of the mechanical equipment of a submarine is an air compressor for charging the bottles. When the submarine is on the surface, " free " air is drawn into the compressor cylinder. On the next stroke the admission valves are closed and, as the piston moves back, the pressure is continuously raised until the delivery valves open. The air pressure must be higher than that in the bottles to overcome the valve springs. Air subjected to a high pressure gets very hot. To minimize this heating, the compression is carried out in several cylinders, i.e. in " stages," the air being cooled by water in passing from one stage to the next. Compressed-air plants are subject to trouble in cold weather from the freezing of the water-vapour in the air.—BIBLIOGRAPHY: E. G. Harris, *Compressed Air*; G. D. Hiscox, *Compressed Air*.

COMPRESSIBIL'ITY. The property of bodies in virtue of which they may be pressed into smaller bulk. All bodies are compressible, liquids more so than solids. Gases are the most compressible, and may be liquefied by pressure and cold combined. Those bodies which occupy their former space when the pressure is removed are called elastic.

COMPTON, Edward. British actor and author, son of Henry Compton, the actor, born in 1854, died in 1918. Educated at Kensington, he went on the stage and appeared at Bristol in 1873, and at Drury Lane in 1877. In 1881 he organized the Compton Comedy Company. He wrote several plays, and a life of his father.

COMPURGA'TION. A mode of defence allowed by the Anglo-Saxon law in England, and common to most of the Teutonic tribes. It was generally known in England as the " wager of law." The accused was permitted to call a certain number of men (from one to thirty, but usually twelve), called compurgators, who joined their oaths to his in testimony to his innocence. They were persons taken from the neighbourhood, or otherwise known to the accused, and acted rather in the character of jurymen than that of witnesses, for they swore to their belief, not to what they knew; that is, on the accused making oath of his innocence they swore that he

was not an outlaw or a "kinless loon," but a regular member of society, and that they believed he was speaking the truth. Compurgation in the ecclesiastical courts was not abolished till the reign of Elizabeth.

COM'STOCK LODE. A lode exceptionally rich in gold- and silver-ores on the east slope of the Virginia Mountains, in Nevada, U.S.A., not far from the Californian border. It was made famous on its discovery by speculators in San Francisco, but continued as one of the foremost silver-mines after the first craze for gold. The deep workings and the drainage-tunnels some miles in length have been utilized for important researches on igneous rocks and subterranean temperatures.

COMTE (kont), **Isidore Auguste Marie François Xavier.** Founder of the "positive" system of philosophy, was born at Montpellier on 12th Jan., 1798, died at Paris 1857. His family were zealous Catholics and Royalists. He was educated at the École Polytechnique, and embraced enthusiastically the Socialist tenets of St. Simon. As one of his most distinguished pupils, he was employed in 1820 to draw up a formula of the doctrines professed by the St. Simonian school, which he accordingly accomplished in his *Système de Politique Positive*. This work did not, however, meet with the approbation of St. Simon, who asserted that Comte had made a very important omission by overlooking the religious or sentimental part of human nature.

In 1826 Comte commenced a course of lectures on positive philosophy, but only four lectures were given when he became deranged in mind, and did not recover till the end of 1827. In 1830 he commenced the publication of his *Cours de Philosophie Positive*, which was completed in six volumes in 1842, and was freely translated into English and condensed by Harriet Martineau (2 vols., 1853). Some aspersions on his superiors at the École Polytechnique, where he held the posts of teacher and examiner, led to his dismissal, and J. S. Mill persuaded some English friends to subscribe a temporary subsidy. At a later period M. Littré organized a general subsidy, which afforded Comte a moderate degree of comfort in his later years.

In 1845 he made the acquaintance of Clotilde de Vaux, who seems to have inspired him with a depth and tenderness of moral and æsthetic feeling before unknown in him. This appears in his second great work, *Positivist Polity* (1851-54); *The Positivist Catechism* (1852); and his last work, *Subjective Synthesis* (1855). In his religion of humanity he himself assumed the office of high priest, performing marriage and funeral rites on behalf of the disciples who had been induced to adopt his system. These, however, were never very numerous; and as a practical faith his system is now stationary, though as a philosophy of knowledge it is widely accepted. His works have been made known to English readers mainly by G. H. Lewes's *Comte's Philosophy of the Sciences*, Miss Martineau's translation above mentioned, and by the works of E. Caird, E. S. Beesley, and F. Harrison. (*See* POSITIVISM.) BIBLIOGRAPHY: E. Littré, *Auguste Comte et la philosophie positive*; J. S. Mill, *Auguste Comte and Positivism*; J. Fiske, *Outlines of Cosmic Philosophy*; E. Caird, *The Social Philosophy and Religion of Comte*; L. Lévy-Bruhl, *La philosophie d'Auguste Comte* (English translation, 1903).

CO'MUS. In the later Greek mythology, the god of revelry, feasting, and nocturnal entertainments, generally represented as a drunken youth. Milton's *Comus* is a creation of his own. He represented the god as born from the loves of Bacchus and Circe.

COM'YN, John, Lord of Badenoch. One of the commissioners sent to confer about the marriage of the Maid of Norway to Prince Edward of England. On the competition for the Scottish throne in 1291 Comyn put in a claim as a descendant of Donald Bane. The date of his death is uncertain, but he was alive in 1299. His son, John Comyn, called the "Red Comyn," was chosen one of the three guardians of Scotland, and defeated the English at Roslin in 1302. He submitted to Edward I. in 1304, and was killed by Bruce in the Convent of the Minorites at Dumfries in 1306.

CON. An Italian preposition signifying *with*, and of frequent occurrence in musical phraseology: for example, *con amore*, with feeling; *con brio*, brilliantly; and *con gusto*, with taste.

CONA'CRE. A term applied to a system common in Ireland, of underletting a portion of a farm for a single crop, the rent being paid to the farmer in money or in labour.

CONATION. In psychology, a term used by Sir William Hamilton to designate one of the three great divisions of mind, the other two being *cognition* and *feeling*. As used by him it included the mental states of desire and volition alone; but modern writers make the term broad

enough to include every state of mental change, so that we find conation wherever consciousness, of itself, drifts from one state to another. Although akin to feeling and attention, it is distinct from either. The word is occasionally applied to those sensations, whether painful or pleasant, which accompany muscular activity. The adjective " conative " was used by Cudworth (1688).

CONCAN. A maritime subdivision of India, in the Presidency of Bombay. It consists of a long belt of sea-coast, stretching from north to south for about 220 miles, with an average breadth of 35 miles, and bounded on the east by the Western Ghauts. It includes the town and Island of Bombay. Area about 13,500 sq. miles; pop. about 3,000,000.

CONCARNEAU (kōn-kär-nō). A seaport, France; department of Finistère, partly on an island in the Bay of La Forêt; it has sardine fishing and sea-bathing. Pop. 7710.

CONCAVE. Hollow and curved or rounded, as the inner surface of a spherical body. A surface is *concave* when straight lines drawn from point to point in it fall between the surface and the spectator; and *convex* when the surface comes between him and such lines.

CONCENTRA'TION. In chemistry, the act of increasing the strength of solutions. This is effected in different ways: by evaporating off the solvent, as is done in the separation of salt from sea-water; by distilling off the more volatile liquid, as in the rectification of spirit of wine; by the use of low temperatures, as in the purification of benzol; by difference of fusibility, as in Pattinson's process for desilverizing lead.

CONCEPCION'. A seaport of Chile, capital of a province of the same name, on the right bank of the Biobio, 7¼ miles from its mouth, a well-built town, with a cathedral. Its port at Talcahuano, a small town on the Bay of Concepcion, about 8 miles distant, is one of the best in Chile. Concepcion was founded in 1550, and has suffered much from earthquakes and attacks by the Araucanians. Pop. 77,589.

CONCEP'TION. The act or power of conceiving in the mind; in philosophy, that mental act or combination of acts by which an absent object of perception is brought before the mind by the imagination. In biology conception is the coalescence of the male and female generative elements, producing pregnancy.

CONCEPTION, Immaculate. In the Roman Catholic Church, the doctrine that the Virgin Mary was born without the stain of original sin. This doctrine came into favour in the twelfth century, when, however, it was opposed by St. Bernard, and it afterwards became a subject of vehement controversy between the Scotists, who supported, and the Thomists, who opposed it. In 1708 Clement XI. appointed a festival to be celebrated throughout the Church in honour of the immaculate conception. Since that time it was received in the Roman Church as an opinion, but not as an article of faith until the year 1854, when the Pope issued a bull which makes the immaculate conception a point of faith.

CONCEP'TUALISM. In metaphysics, a doctrine in some sense intermediate between realism and nominalism. While realism maintains, in one form or another, the objective reality of the universal, and nominalism takes the opposite course of denying actuality to all save the particular thing, conceptualism mediates between these extremes. Conceptualism assigns to universals an existence which may be called logical or psychological, that is, independent of single objects, but dependent upon the mind of the thinking subject, in which they are as notions or conceptions. *See* NOMINALISM; REALISM.

CON'CERT. A public or private musical entertainment, at which a number of vocalists or instrumentalists, or both, perform singly or combined. The first concerts to which an audience was admitted on payment of a fee were those established by John Banister in 1672 in London. The practice was continued in 1679 by Thomas Britton.

CONCERTI'NA. A musical instrument invented in 1829 by Sir Charles Wheatstone, the principle of which is similar to that of the accordion. It is composed of a bellows, with two faces or ends, generally polygonal in shape, on which are placed the various stops or studs, by the action of which air is admitted to the free metallic reeds which produce the sounds. In the English concertina the compass is three octaves and three notes. The German concertina is an inferior instrument. *See* ACCORDION.

CONCERTO (kon-cher-tō). In music, a kind of composition, usually in a symphonic form, written for one principal instrument, with accompaniments for a full orchestra.

CONCESSION. A permission conceded by a Government to a person or company to do certain things

specially applied to grants of land, or privileges or immunities in connection with certain enterprises, such as mining, the construction of railways, canals, or the like, usually subject to fixed conditions and limitations.

CONCH (kongk). A marine shell, especially a large spiral shell of a trumpet shape, and which may be blown as a trumpet, as is the practice in Hindustan and some of the Pacific Islands. Shell-fish forming the staple food of the negroes in the Bahamas, the inhabitants are sometimes called "Conches" or "Conks."

CONCHIFERA (kon-kif'ẽ-ra). Lamarck's name for that large class of acephalous molluscs which have shells consisting of two pieces, commonly known as *bivalves* (oyster, mussel, etc.). They are also known as Lamellibranchiata, in allusion to the plate-like gills, or Pelecypoda, which has reference to the axe-shaped foot.

CONCHOL'OGY. The science of shells, that department of zoology which treats of the nature, formation, and classification of the shells with which the bodies of many mollusca are protected; or the word may be used also to include a knowledge of the animals themselves, in which case it is equivalent to *malacology*. In systems of conchology shells are usually divided into three orders. Univalves, Bivalves, and Multivalves, according to the number of pieces of which they are composed. *See* MOLLUSCA.

CONCILIATION ACT. An Act passed in 1896 to take the place of earlier Acts of a similar kind and providing machinery for preventing and settling trade disputes. Boards or bodies formed for the purpose of settling disputes between employers and workmen by conciliation and arbitration may be registered by the Board of Trade as "conciliation boards," and the Board provides regulations for conciliation proceedings, and may itself take important measures by inquiry and otherwise to bring about a settlement by conciliation or arbitration, if both parties agree to arbitration. Boards of conciliation have been established in almost all important industrial centres, and have been of marked advantage in helping to prevent strikes.

CON'CLAVE. The place where the cardinals assemble for the election of the Pope; also the electoral assembly of the cardinals themselves. Pope Gregory X., whose election had been delayed for three years, established in the council at Lyons (1274) the regulations of the conclave. The cardinals are shut up together in a particular suite of apartments in the palace where the pontiff dies, and they are supposed to have no communication with the outside world during the period of election. The companion, either lay or clerical, whom the cardinal is allowed to take with him into the conclave during the election of a Pope is called a *conclavist*. The office is one of great delicacy and trust.—Cf. L. Lector, *Le Conclave: origine, histoire, organisation, législation ancienne et moderne*.

CON'CORD. In music, the combination of two or more sounds pleasing to the ear. The simple concords are the fifth, the fourth, the major or minor third, and the major or minor sixth. Any number of notes form a concord if the interval between any pair is a simple concord. Thus, for example, the notes C, E, G, C′ form a concord, or, to use tonic sol-fa notation, the notes *d*, *m*, *s*, *d′* on any key. Certain combinations which do not fulfil the above definitions, but yet are not unpleasing to the ear, are also classed by musicians as concords.

CONCORD. Several places in the United States, particularly the capital of New Hampshire, on the Merrimac, 60 miles N.N.W. of Boston, with manufactures of carriages, hardware, woollens, and paper. Pop. 25,228 (1930).—**Concord,** in Massachusetts, was the home of Emerson, Hawthorne, Thoreau, and the Alcotts. Pop. 7477.

CONCOR'DANCE. A book in which the principal words used in any work or number of works, as the Scriptures, Shakespeare, Milton, Tennyson, Homer, etc., are arranged alphabetically, and the book, chapter, and verse, or act, scene, line, or other subdivision in which each word occurs, are noted; designed to assist an inquirer in finding any passage by means of any leading word which he can recollect, or to show the character of the language and style of any writer. Some of the most approved concordances in English are those of the Bible by Cruden, Butterworth, Brown, and Taylor. Young's *Analytical Concordance* was published in Edinburgh in 1879. Of non-biblical concordances, those of Mary Cowden Clarke and John Bartlett to Shakespeare deserve especially to be mentioned.

CONCOR'DAT. A convention between the Pope, as head of the Roman Catholic Church, and any secular government for the settling of ecclesiastical relations. One of the most important of the earlier concordats,

that of Worms, called also the *Calixtine Concordat*, made in 1122 between Pope Calixtus II. and the Emperor Henry V., has been regarded as the fundamental law of the Church in Germany. Another celebrated concordat was that agreed upon between Cardinal Gonsalvi, in the name of Pius VII., and Napoleon in July, 1801. By it the head of the State had the nomination of bishops to the vacant sees; the clergy became subject in temporal matters to the civil power; all immunities, ecclesiastical courts, and jurisdictions were abolished in France, and even the regulations of the public worship and religious ceremonies, and the pastoral addresses of the clergy, were placed under the control of the secular authorities. This concordat was practically abrogated by the law of 9th Dec., 1905, on the separation of Church and State. The Government had previously broken off diplomatic relations with the Papacy.—Cf. Séhé, *Les Origines du Concordat.*

CON'CRETE. A technical term in logic, applied to an object as it exists in nature, invested with all its attributes, or to the notion of such an object. Concrete is opposite to abstract. The names of individuals are concrete; those of classes, abstract. A concrete name is a name which stands for a thing; an abstract name is a name which stands for the attribute of a thing.

CON'CRETE. An intimate mixture of broken stone, or gravel, and sand, with lime or cement. It is universally used in the foundations of buildings of every kind, bridge-piers, in the formation of walls of buildings, both in blocks and monolithically, in concrete sewer tubes (from 18-inch to 4-feet diameter), in roadways to carry the heaviest traffic, in reinforced-concrete construction of walls, floors, and stanchions, and, finally, as the latest development, in the building of concrete barges and sea-going ships up to 2000 tons.

1. **Lime concrete.**—This may be normally composed of six parts of clean broken shingle or brick, two parts of washed sand, and one part of ground lias lime. The whole is thoroughly well mixed together in a dry state, and then sufficient water is added to bring the whole to a semi-plastic state on further mixing. No more water should be added than is necessary to bring it to this state.

2. **Cement concrete.**—During the past decade Portland cement has almost superseded lime in the making of concrete, the resulting mixture having a much greater ultimate strength, and being free from certain defects of lime concrete when used in large masses. The "aggregate," or broken stone used, may vary in size from ¼-inch chippings to 3-inch gauge, depending upon the purpose for which it is to be used. A proper proportioning of the sand to fill the voids in the "aggregate," and of the cement to fill the voids in the mixture, is necessary for a sound and economical mixture, and cleanliness and clean water are essential. BIBLIOGRAPHY: Kempe, *Engineer's Year Book*; Mitchell, *Building Construction*; C. F. Marsh and W. Dunn, *Reinforced Concrete*; L. C. Sabin, *Cement and Concrete*; A. B. Searle, *Cement, Concrete, and Bricks.*

CONCRETION. In geology, a mass of a more or less nodular form, and sometimes nearly spherical, resulting from the coming together of mineral matter in a rock in which it has been at one time diffused. Concretions often occur along certain horizons, following the stratification, and their secondary nature is evidenced by the fact that the lines of bedding are continuous through them. Not infrequently a fossil is found in the centre as a nucleus, and fossil fish sometimes determine the form of the concretion. While some concretions may arise from a local concentration of cementing material in a rock, in the majority of cases an exchange of substance has taken place, as when clayey matter has been removed to make way for a deposition of iron carbonate or iron sulphide. Flints, which replace in every detail the calcareous structures of a limestone, are examples of concretions formed by complete substitution. A quarry may be worked for the sake of its concretions of ironstone, calcium phosphate, or other substances.

CONCRE'TIONS, Morbid. In animal economy, hard substances that occasionally make their appearance in different parts of the body, as well in the solids as in those cavities destined to contain fluids. They are usually named according to the parts of the body in which they occur, as *pineal, salivary, pancreatic, hepatic, pulmonary, urinary* concretions, etc. Their composition is equally various, but the most common constituents are phosphates, urates, or other salts, in combination with mucus, albumen, fibrin, and other organic matter. *See* CALCULUS.

CONCU'BINAGE. Sexual cohabitation of a man and woman without legal marriage. It was freely permitted among the ancient peoples of the East, Babylonians, Assyrians, Hebrews, and Greeks; but among the Romans in the case of unmarried

men concubinage was limited by the Lex Julia and Lex Papia Poppæa to a single concubine of mean descent.

CONCURRENT JURISDICTION. The jurisdiction of different courts authorized to take cognizance of the same kind of case. In criminal cases the court which first takes up a case has the right of prevention, that is, of deciding upon that case exclusive of the other courts which but for that right would have been equally entitled to take cognizance of it. In civil cases it lies with the suitor to bring his cause before any court he pleases, which is competent to take it up.

CONCUSSION OF THE BRAIN. A term applied to certain injuries of the brain resulting from blows and falls, though they may be unattended with fracture of the skull. Stupor or insensibility, sickness, impeded respiration, and irregular pulse are the first symptoms, and though these may subside there is always for a time more or less risk of serious inflammation of the brain setting in.

CONDAMINE, Charles Marie de la. *See* LA CONDAMINE.

CONDÉ, Louis de Bourbon, founder of the House of. Born 1530; killed after the battle of Jarnac, 1569. *See* BOURBON.

CONDÉ, Louis de Bourbon, Prince of (the *Great Condé*). A famous general, born in 1621. In 1641 he married a niece of Cardinal Richelieu. His defeat of the Spanish at Rocroi, in 1643, was followed, in 1645, by his defeat of Mercy at Nördlingen, and by his capture of Dunkirk in 1646, the year in which he inherited his father's title. During the troubles of the Fronde he at first took the side of the court; but believing himself to be ill requited by Mazarin, he put himself at the head of the faction of the *Petits Maîtres*, and was imprisoned for a year by Mazarin (1650). On his release he at once put himself at the head of a new Fronde, entered upon negotiations with Spain, and, his attack on Paris being indecisive, retired to the Netherlands, where he was appointed generalissimo of the Spanish armies. In this capacity he unsuccessfully besieged Arras in 1654; but he was more fortunate at Valenciennes in 1656, and at Cambrai in 1657. In 1658 he was defeated before Dunkirk by Turenne, but was restored to his rank in France after the peace of 1659. In 1668 he accomplished the reduction of Franche-Comté in three weeks; and in 1674 he defeated the Prince of Orange at Senef. His successes over Montecuculi in Alsace, in 1675, closed his military career. Four years later he retired to Chantilly, near Paris, and died at Fontainebleau in 1686. BIBLIOGRAPHY: A. Lemercier, *Histoire du Grand Condé*; Lord Mahon, *Life of Louis, Prince of Condé*; Fitzpatrick, *The Great Condé and the Period of the Fronde*.

CONDÉ, Louis Joseph de Bourbon, Prince of. Born at Chantilly in 1736; only son of the Duke of Bourbon and the Princess of Hesse-Rheinfels. He distinguished himself in the Seven Years' War, and in 1762 defeated the Prince of Brunswick at Johannisberg. On the outbreak of the revolution in 1789 he emigrated, and in 1792 formed, at Worms, a corps of emigrant nobility, which first joined the Austrian, and in 1795, the English service. In 1797 he entered the Russian service, but in 1800, after the separation of Russia from the coalition, re-entered for a time the English army. He lived in England till 1813, returned to Paris in 1814, received various honours, and attended the king in his flight to Ghent. On his return he was appointed president of a bureau of the chamber of peers, but soon after retired to Chantilly. He died at Paris in 1818. He wrote *Essai sur la vie du Grand Condé*, 1798.

CONDÉ (kōn-dā). A town and fortress of France, department of Nord, at the confluence of the Hayne and Scheldt. It gave their title to the Condé family. Pop. 4000. For another Condé *see* CONDE-SUR-NOIREAU.

CONDENSA'TION. In chemistry and physics, the act of reducing a gas or vapour to a liquid or solid form.—*Surface condensation*, a mode of condensing steam by bringing it in contact with cold metallic surfaces in place of by injecting cold water.

CONDENSED MILK. Milk preserved by evaporating part of its moisture, mixing with refined powdered sugar, and packing in air-tight cans hermetically sealed: the sugar may also be omitted. If condensed milk is used for infant feeding, it should be mixed with not more than five volumes of water to one of milk.

CONDENSER. Electrical.—An apparatus for storing electrical charges. It consists of two sets of metal plates separated from each other by an insulating medium called the dielectric. One set of plates is connected to the source of positive electricity, and the other to the negative pole or to earth. In one form, the condenser contains layers of tin-foil separated by sheets of paraffined paper; in others, stiff metal plates are separated by air;

in the Leyden jar, glass is the dielectric. Condensers of variable capacity are much used in wireless telegraphy.

Optical.—The system of lenses in a magic lantern nearest the source of light. The rays of light are caused by it to converge on the picture, which thus receives the necessary illumination.

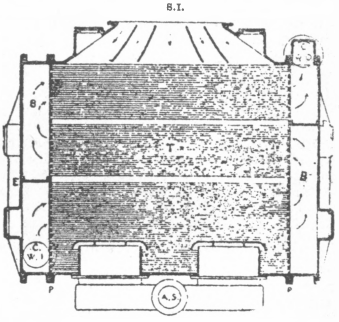
Engineering.—A very large number of tubes arranged parallel to each other in a cast-iron box, and designed to condense steam into water. Cold water flows inside the tubes, and the hot condensing steam is on the outside of them. In the process of condensing the steam gives up its latent heat, and this heat is absorbed by the cooling water, which, in consequence, leaves the condenser hotter than it enters it. The tubes are usually arranged horizontally, though sometimes they are vertical. The horizontal arrangement appears to be the more successful. B B are the water "boxes"; P P the tube plates through which the tubes enter the water-boxes; S I the flange by which the condenser is joined to the exhaust-pipe from the engine; T the space for condensation, which is filled with tubes a few inches apart. The tubes are made of a non-ferrous metal such as brass or pure copper. They are about $\frac{3}{4}$ inch outside diameter, and about $\frac{1}{16}$ inch thick. They may be 15 to 20 feet long. Supporting plates are sometimes provided through which the tubes pass. If the water, on its way from inlet to outlet, passes only once along the length of the condenser, the condenser is a *single-pass* one. If plates are inserted at F F (as in the figure) so as to divide the water-boxes into water-tight compartments, the condenser becomes a *three-pass* one, as the water has to pass three times along the length of the condenser. The most important engineering problems that arise are:

1. **The Removal of Air.**—Air passes into the condenser as well as steam, and must be removed by an air-pump. *See* AIR-PUMP.

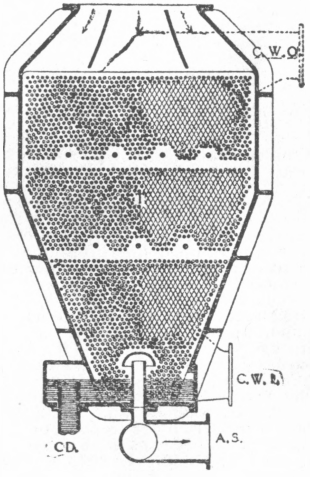
2. **The Size of the Condenser.**—The condensing surface required depends upon (*a*) the amount of steam to be condensed and its quality; (*b*) the amount of circulating water to be used and its temperature (the amount ranges between forty and seventy times the amount of steam to be condensed); (*c*) the vacuum to be obtained which determines the temperature of the condensing steam; (*d*) the speed of the water in the tubes. In practice the usual designs work out at 6 to 10 lb. of steam condensed per square foot of condensing surface per hour.

3. **Vibration of Tubes.**—This is important in power-stations where turbine machinery is used, and in ships. The natural frequency of vibration of the tubes *when full of water* should be different from that of the turbines or of other sources of external vibration.

4. **Corrosion of Tubes.**—This is an ever-present trouble, and even dangerous in some cases. A destroyer may be put out of action at a critical moment in a sea-fight by a leaky con-



Longitudinal Section



Cross-section

Three-pass Surface Condenser

C.W.I., Cooling water inlet. C.W.O., Cooling water outlet. S.I., Steam inlet. A.S., Air suction. C.D., Condensate discharge.

denser. When corrosion sets in, little pits are found which eat through the tubes, and the condensed steam becomes contaminated with the dirty, or what is worse, salt condensing water. Salt-water plays havoc in steam-boilers, and it must be remembered that the water condensed in the condenser is pumped straight into the boiler again. The causes are very little understood, and nothing but trial and error seems to be of much use in selecting condenser-tube metal.

CONDER, Claude Reignier. Colonel of the Royal Engineers and authority on Palestine, born 1848, died in 1910. He was for some years at the head of the survey of Palestine, served in Egypt, and was present at Kassassin and Tel-el-Kebir, also in South Africa (1884-85). He was connected with ordnance survey both in Britain and Ireland. His works include: *Tent Work in Palestine, Memoirs of the Surveys of Eastern and of Western Palestine, Handbook to the Bible, Palestine, The Hittites*, and *The City of Jerusalem.*

CONDESCEN'DENCE. In Scots law, that part of the written pleadings in an action which contains the statement of the facts alleged by the pursuer to be true and relied on by him, and gives the pleas in law on which his case is founded.

CONDÉ-SUR-NOIREAU (koṇ-dā-sür-nwä-rō). A town, France, department of Calvados, at the confluence of the Noireau and Drouance. Chief manufacture, cotton. Pop. 6650.

CONDILLAC (kōṇ-dē-yak), **Étienne Bonnot de.** French philosopher, born in 1715. His *Essai sur l'Origine des Connaissances Humaines* (1746), a summary of Lock's *Essay concerning Human Understanding*, in large part a polemic against abstract methods of philosophizing, struck the key-note of his system. In his *Traité des Systèmes* (1749) he continued the condemnation of all systems not evolved from experience or from sensation, such as the abstract systems of Descartes, Malebranche, Leibnitz, and Spinoza. In 1754 appeared his *Traité des Sensations*, and in 1755 his *Traité des Animaux*, a criticism of Buffon. The sagacity and clearness of his writings led to his appointment as tutor to the nephew of Louis XV., the infant Duke of Parma, for whom he wrote in 1755 his *Cours d'Études*, including a grammar, an *Art d'Écrire*, an *Art de Raisonner*, an *Art de Penser*, and a general history. His work *Le Commerce et le Gouvernement* appeared in the same year as the *Wealth of Nations* (1776), and was no unworthy companion to it. In 1768 he was elected to the Academy. He died shortly after the publication of his *Logic* in 1780, his *Langue des Calculs* being published posthumously in 1798. Condillac may be considered the forerunner in psychology, ethics, and sociology of the English school represented by Mill, Bain, and Spencer.—BIBLIOGRAPHY: G. H. Lewes, *History of Philosophy*; L. Dewaule, *Condillac et la psychologie anglaise contemporaine.*

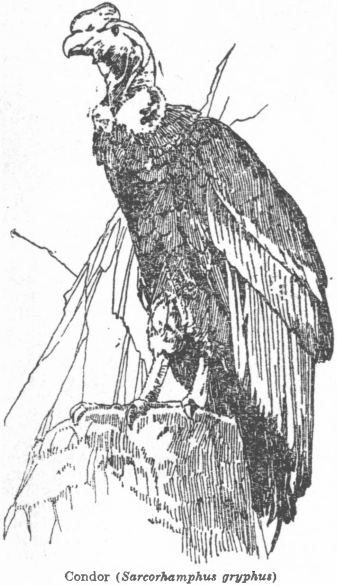
CONDITIONED and **UNCONDITIONED.** In philosophy, terms introduced by Sir William Hamilton. The Unconditioned is regarded by Sir William Hamilton as a genus including two species: the Infinite, or the unconditionally unlimited, and the Absolute, or the unconditionally limited; and the thesis which he maintains and expounds, and which forms one of the leading doctrines of his philosophical system, is that the Unconditioned, as thus explained, is entirely unthinkable. The mind is confined, in point of knowledge though not of faith, to the limited and conditioned—the Conditioned being the mean between two unconditionates, mutually exclusive and equally inconceivable, but of which, on the principles of contradiction and excluded middle, *one must be admitted as necessary.* Thus infinite space is inconceivable by us, while at the same time it is equally impossible to us to conceive of space as finite; yet one of these must be admitted necessary, and our conception is in some sense a mean between the inconceivables. From such considerations it follows that we cannot conclude either as to the existence or non-existence of the Absolute.

The doctrine was applied by Mansel to determine the limits of religious thought. As we can rationally form no positive notion or concept of God, our reason must be helped and supplemented by our faith in revelation. *See* AGNOSTICS; THEISM.

CONDOM (koṇ-dōṇ). A town of south-west France, department of Gers, on a height above the Baïse. It has a cathedral, now a museum; a bishop's palace, now a court-house; and a college. Bossuet was at one time Bishop of Condom. Pop. 6640.

CONDONA'TION. In law, forgiveness of injury. In an action for divorce on the ground of adultery it is a legal plea in defence. An act once condoned is in the eyes of the law as if it had never been committed, unless the guilty party repeats the offence. Condonation, therefore, is always conditional, and is valid only so long as the condoned misconduct is discontinued.

CON'DOR (Spanish name, from Peru. *cuntur*). A South American bird, the *Sarcorhamphus gryphus*, one of the largest of the Vulturidæ or vulturine birds. In its essential features it resembles the common vultures, differing from them mainly in the large cartilaginous caruncle which surmounts its beak, and in the large size of its oval and longitudinal nostrils placed almost at the extremity of the cere. Despite the many stories of its gigantic proportions, Humboldt met with no specimens whose wings exceeded 9 feet in expanse, though it has occasionally been known to attain



Condor (*Sarcorhamphus gryphus*)

an expanse of 14 feet. They are found in greatest numbers in the Andes chain, frequenting regions from 10,000 to 15,000 feet above the level of the sea, where they breed, depositing their two white eggs on the bare rock. They are generally to be seen in groups of three or four, and only descend to the plains under stress of hunger, when they will successfully attack sheep, goats, deer, and bullocks. They prefer carrion, however, and, when they have opportunity, gorge themselves until they become incapable of rising from the ground, and so become a prey to the Indians. The king-vulture (*S. Papa*) is another bird of the same genus.

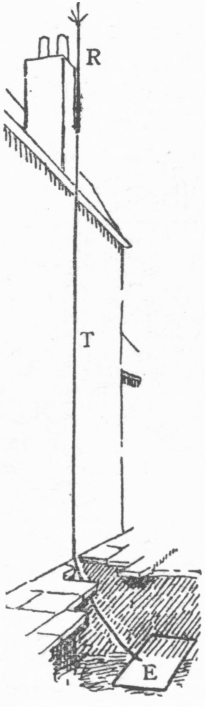
CONDORCET (kon-dor-sā), **Marie Jean Antoine Nicolas de Caritat, Marquis de.** An eminent French writer, born in 1743. At the age of twenty-one he presented to the Academy of Sciences an *Essai sur le Calcul Intégral*, and in 1767 his *Mémoire sur le Problème des Trois Points* appeared, both being afterwards united under the title of *Essais d'Analyse*. The merit of this work gained for him in 1769 a seat in the Academy of Sciences, of which, after the publication of his *Éloges des Académiciens morts avant 1699* (1773), he was appointed perpetual secretary (1777). In 1777 his *Theory of Comets* gained the prize offered by the Academy of Berlin. He contributed to the *Transactions* of many learned societies; and took an active part in the *Encyclopédie*. During the troubles of the first French revolution his sympathies were strongly engaged on the side of the people. By the city of Paris he was elected deputy to the Legislative Assembly, of which he was soon appointed secretary, and in Feb., 1792, president. On the trial of Louis he was in favour of the severest sentence not capital; at the same time he proposed to abolish capital punishments, except in case of crimes against the State.

The fall of the Girondist party, 31st May, 1793, prevented the constitution which Condorcet had drawn up from being accepted, and as he freely criticized the constitution which took its place he was denounced as being an accomplice of Brissot. Madame Verney, a woman of noble feelings, secreted him for eight months, during which he wrote his *Esquisse d'un Tableau Historique des Progrès de l'Esprit Humain*. Lest he should endanger her safety, however, he left the house secretly in opposition to her wishes, fled from Paris, and wandered about till arrested and thrown into prison, where, on the 8th April, 1794, he was found dead on the floor, having apparently swallowed poison. —BIBLIOGRAPHY: Lord Morley of Blackburn, *Critical Miscellanies*; E. Caillaud, *Les idées économiques de Condorcet*; L. Cahen, *Condorcet et la Révolution française*.

CONDOTTIERI (kon-dot-tē-ā'rē). An Italian name given to the captains of those bands of mercenary soldiers who, in the fourteenth and fifteenth centuries, hired themselves out to carry on the petty wars of the Italian states. Venice, however, began to employ condottieri as early as 1143. Montreal d'Albarno, a gentleman of Provence, was the first to give definite organization to a lawless band of this kind, and many of them attained

considerable size and power. Among the most noted leaders of the condottieri were Sir John Hawkwood, commander of the famous White Company, Carmagnola, and Sforza Attendolo, whose son made himself Duke of Milan. For the most part these mercenaries were good soldiers and splendidly equipped, but rapacious and cruel to all but their own class.

CONDUCT'OR, or LIGHTNING-CONDUCTOR. A metal rod attached to buildings or ships for the purpose of averting the destructive results of lightning. By its means either the electricity of the clouds, the cause of lightning, is conducted without explosion into the earth, or the lightning itself is received and conducted quietly into the earth or water without causing damage. It was invented by Benjamin Franklin about 1752, and met with speedy general adoption, the first conductor in England being erected in 1762. It usually consists of a stout galvanized iron rod with one or more points at the top, the lower end being metallically connected with thick strips of copper, which are carried into the ground to a considerable depth and terminated, if possible, in water or wet earth. A single lightning-conductor sometimes fails to protect a building, and experts recommend not only that a number of such paths should be provided for the electric discharge, but that all masses of metal outside and inside the building should have good metallic connections with the lightning-rod. The earthed end of the rod, if of sheet metal, requires to be tested annually; but tubular "earths" may be ensured the necessary moisture by being connected with the rain-pipe.—BIBLIOGRAPHY: Sir Oliver Lodge, *Lightning Conductors and Lightning Guards*; K. Hedges, *Lightning Conductors*.



Lightning-Conductor
R, Rod. T, Conductor tape. E, Earth plate.

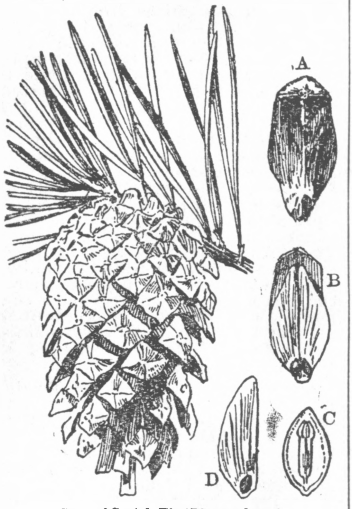
CONDUIT. Channel for flowing fluids. Water conduits are nowadays often reinforced concrete ducts. Conduits protect electrical wiring systems in buildings, and accommodate underground gas and hydraulic mains, telegraph, telephone, light or power cables. Subtrolly conduits enclose the conductors of subtrolly electric railways.

CON'DYLE (Gr. *kondylos*). In anatomy, a protuberance on the end of a bone serving to form an articulation with another bone: more especially applied to the prominence of the occipital bone for articulation with the spine, and to the lower end of the thigh bone at the knee.

CONDY'S FLUID. A sanitary and antiseptic preparation of permanganate of potash which is now largely used as a deodorizer and disinfectant in fevers, etc. It is also employed as a gargle in diphtheria and other throat affections, and is expecially valuable for cleansing ulcers and sores.

CONE. As used in geometry, generally means a right circular cone, that is, the solid figure traced out when a right-angled triangle is made to revolve round one of the sides that contain the right angle. Or, in more general terms: Let a straight line be held fixed at one point, and let any other point of the line be made to describe any closed curve which does not cut itself; the solid figure traced out is a cone. When the curve which the second point describes is a circle, the cone is said to be circular. The cubical content of a cone on a plane base is one-third of that of a cylinder on the same base and of the same altitude, and is therefore found

by multiplying the area of the base by the altitude, and taking one-third of the product. *See* CONIC SECTIONS.



Cone of Scotch Fir (*Pinus sylvestris*)

A, Bract (outer surface). B, Bract (inner surface), with seeds attached. C, Section of seed (enlarged). D, Seed and wing.

CONE, or STROBILUS. In botany, a dry compound fruit, consisting of many open scales bearing seeds at the base, as in the conifers. The term is also used in a wider sense, so as to include the sporangium-bearing reproductive shoots of Lycopods and horse-tails.

CONEGLIANO (ko-nel-yä'nō). A town, Italy, 35 miles north of Venice. It has a castle and a cathedral (1492) with paintings by Cima da Conegliano. The place is noted for its sweet champagne. There are monuments to Dante, Victor Emmanuel, and Garibaldi in the Logia Municipale. The town was captured by the Austrians in 1917, but recovered by Italian and British troops in Oct., 1918. Pop. (commune), 15,800.

CONESSI-BARK. The bark of *Wrightia antidysenterica*, an Apocynaceous plant of India, used as a tonic, a febrifuge, and an astringent in diarrhœa.

CONEY, or CONY. An old name for the rabbit; used also in the English version of the Bible as a translation of a Hebrew word probably meaning the *Hyrax syriacus*, a rabbit-like animal common in Syria and Palestine, inhabiting clefts of rocks.

CONEY ISLAND. A small island of New York, at the west end of Long Island, south of Brooklyn, a favourite summer bathing-resort, having a fine beach, splendid hotels, and great amusement grounds.

CONFEDERATE STATES. The name given to eleven of the Southern States of America which attempted to secede from the Union on the election of Abraham Lincoln, the Abolitionist candidate, to the presidency in Nov., 1860, thus leading to the civil war which lasted till 1865. *See* UNITED STATES.

CONFEDERATION OF THE RHINE. The league of Germanic states formed by Napoleon I. in 1806, and including Bavaria, Würtemberg, Baden, Hesse-Darmstadt, Westphalia, etc. The princes undertook to raise collectively a large body of troops in event of war, and established a Diet at Frankfort; but the failure of Napoleon's Russian campaign of 1812 shook the structure, and the league soon after broke up.

CON'FERENCE. (1) A meeting of the representatives of different foreign countries for the discussion of some question. There have been international conferences at Geneva (1864), London (1864, 1867, and 1871), The Hague (1899), London (Balkan Conference, 1912-13), and Paris (1918-20). (2) A meeting between delegates of the two Houses of Parliament, called to discuss the provisions of a Bill with regard to which they are disagreed, with the object of effecting an agreement between them. (3) The annual meeting of Wesleyan preachers for deliberation on the affairs of the body.

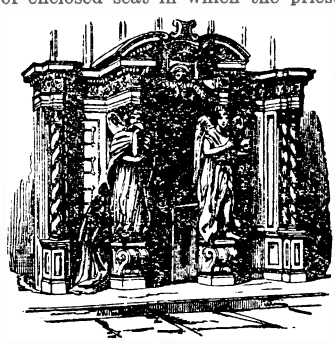
CONFESSION. A term sometimes applied to a profession of faith; for instance, the Confession of Augsburg. It sometimes also signifies a religious sect; as the three Christian confessions—the Roman Catholic, the Lutheran, and the Calvinistic. The *Confiteor* (Lat., I confess) is the confession which Roman Catholic priests make before the altar when beginning mass.

CONFESSION. In relation to sin, which is its customary usage, denotes the disclosure and acknowledgment of sin or of wrong-doing, and is of two kinds:—(*a*) Public confession, or confession before the whole congregation or meeting. Such was the usage of the early Christian Church, and it now survives under the name of penance. (*b*) Private, or auricular, the disclosure of sins to the priest at the confessional, with a view to obtain absolution for them. The

person confessing is allowed to conceal no sin of consequence which he remembers having committed, and the father confessor is bound to perpetual secrecy.

The practice of a public acknowledgment of great sins was altered by Pope Leo the Great, in 450, into a secret one before the priest, and the fourth general Lateran council (1215) ordained that every one of the faithful, of both sexes, come to years of discretion, should privately confess all their sins at least once a year to their own pastor, an ordination still binding on members of the Roman Catholic Church. Confession is a part of the sacrament of penance. Some Anglican clergymen uphold it, and it has been retained by some of the reformed Churches as a preliminary to admission to communion. Confession, meaning the admission or acknowledgment of guilt or wrong-doing, has always played an important part in criminal procedure.—BIBLIOGRAPHY: T. T. Carter, *The Doctrine of Confession in the Church of England*; H. C. Lea, *A History of Auricular Confession and Indulgences in the Latin Church*; article *Penitence* in Hasting's *Encyclopædia* of *Religion and Ethics*.

CONFESSIONAL. In Roman Catholic churches and chapels, a kind of enclosed seat in which the priest



Confessional, Cathedral of St. Gudule, Brussels

sits to hear persons confess their sins. The confessional is often not unlike a sentry-box, the priest sitting within and the penitent kneeling without and speaking through an aperture. Many confessionals are in three divisions or compartments, the centre, which is for the reception of the priest, being closed half-way up by a dwarf door, and having a seat within it. The side compartments, which communicate with the centre by grated apertures, are for the penitents.

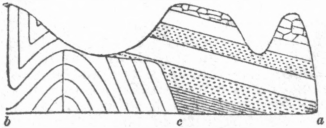
CONFESSION OF FAITH. A statement of religious beliefs, a kind of elaborate creed. (*See* CREED.) What is most distinctively known by this name is the document prepared by the Assembly of Divines which met at Westminster in obedience to an ordinance of Parliament issued 12th June, 1643. The whole number of the assembly amounted to 174 members, mostly Puritans, thirty-two being members of Parliament. There were also six Scottish commissioners appointed to consult and deliberate, but not to vote. One of the chief results of the deliberations was the framing of the Confession of Faith, which, on the return of the Scottish commissioners, was adopted by the Assembly of the Church of Scotland, 27th Aug., 1647.

CONFIDENTIAL COMMUNICATION. In law, a communication made by one person to another which the latter cannot be compelled to give in evidence as a witness. Generally all communications made between a client and his agent, between the agent and the counsel in a suit, or between the several parties to a suit, are treated as confidential. The privilege of confidentiality does not extend to disclosures made to a medical adviser, and in England it has been decided also that confessions made to a priest are not to be treated as confidential.

CONFIRMA'TION. The ceremony of laying on of hands by a bishop in the admission of baptized persons to the enjoyment of Christian privileges, the person confirmed then taking upon himself the baptismal vows made in his name. It is practised in the Greek, Roman Catholic, Lutheran, and English Churches. The Anglican Church holds that confirmation is not to be counted as a sacrament, but, like the Lutheran Churches, it retains "the confirmation of children by examining them of their knowledge in the articles of their faith." In the Roman Catholic Churches a delay of seven years is interposed after baptism. In the Lutheran Church boys and girls are usually confirmed between the ages of thirteen and sixteen; while in the Church of England, though there is no definite ruling in the matter, candidates for confirmation are generally between fourteen and eighteen years of age. The Lord's Supper is not taken in these Churches until after confirmation.—BIBLIOGRAPHY: A. J. Mason, *The Relation of Confirmation to Baptism*; and article in *Catholic Encyclopedia*.

CONFISCA'TION. The act of condemning as forfeited, and adjudging to the public treasury, the goods of a criminal in part punishment of a crime. The term is used of any seizure of property without adequate compensation.

CONFOR'MABLE. In geology, a term applied to strata lying in parallel or nearly parallel planes, and



Conformable Strata *a* and *b*, Unconformable at *c*

having the same dip and changes of dip; the opposite term being *unconformable*.

CONFU'CIUS, or **KONG-FU-TSE,** that is, "the teacher, Kong." The famous Chinese sage, born in 551 B.C. in the province of Shantung, then belonging in part to the small vassal kingdom of Lu. His father, Shuh-liang-heih, who was a warrior of royal descent, died three years later, and the boy was reared in comparative poverty by his mother, Ching-tsai. At the age of seventeen he was made inspector of corn markets, at nineteen he married, and after about four years, in which a son and two daughters were born to him, he commenced his career as a teacher.

In 517 B.C. he was induced by two members of one of the principal houses in Lu, who had joined his band of disciples, to visit the capital with them, where he had interviews with Lao-tze, the founder of Taoism. Though temporarily driven from Lu to Tsi by a revolution, he soon returned thither with an increasing following, and at the age of fifty-two was made chief magistrate of the city of Chung-too. So striking a reformation was effected by him that he was chosen for higher posts, became Minister of Crime, and with the aid of two powerful disciples elevated the state of Lu to the foremost position in the kingdom. Its marquis, however, soon after gave himself up to debauchery, and Confucius became a wanderer in many states for thirteen years. In 483 he returned to Lu, but would not take office. The deaths of his favourite disciples Yen Hwin and Tze-lu in 481 and 478 did much to further his own, which took place in the latter year.

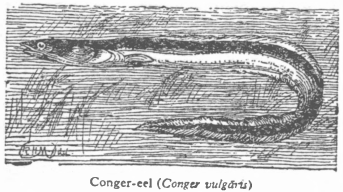
Works.—Confucius left no work detailing his moral and social system, but the name of Confucius is inseparably associated with the classical books of China which contain the foundations of their religious and political beliefs. Five of these books are called *King*; the others are called *Shu*. Confucius is said to have written only one *King*, the *Chuntsin*. Three other *Kings*, the *Shi* or Songs, the *Yih* or Natural Mutations, and the *Shu* or Book of History, he is said merely to have compiled or edited. The fifth *King*, the *Li-ki* or Memorials on Social Laws and Rites, appears to have been composed from information about Confucius. The four *Shu* are entirely by disciples of the sage. The titles are: *Lun-yü* (Discourses and Conversations), *Chung-yung* (Doctrine of the Mean), *Tai-hioh* (Great Study), and *Meng-tsze*, or works of Mencius.

Teaching.—The teaching of Confucius has had, and still has, an immense influence in China, though he can hardly be said to have founded either a religion or a philosophy. Confucius was the type of the virtuous man without religion, although he was religious after the manner of religious men of his age and land. His teaching did not include the element of future retribution, but, like the Old Testament, he had much to say of rewards and punishments meted out in the present life by the all-seeing Heaven-god, from the traditional belief in whom he did not depart, as is evident from numerous passages. He was, however, above all, a political reformer, founding his political principles upon moral bases. All his teaching was devoted to practical morality and to the duties of man in this world in relation to his fellow-men; in it was summed up the wisdom acquired by his own insight and experience, and that derived from the teaching of the sages of antiquity. To make oneself as good as possible was, according to Confucius, the main business of life. Like Socrates, he believed that vice was the result of ignorance, and that knowledge led to virtue and moral perfection. And the love of virtue that he felt himself he sought to develop in others by his teaching. Man's nature, according to Confucius, is originally good, and merely requires cultivation on right lines to bring it to its highest perfection.—BIBLIOGRAPHY: R. K. Douglas, *Confucianism and Taoism*; J. Legge, *The Religions of China*; G. G. Alexander, *Confucius*; W. E. Soothill, *The Analects of Confucius*.

CONGÉ D'ÉLIRE (kŏn-zhā dā-lēr). The Norman French for "leave to elect," designates the sovereign's licence authorizing the dean and

chapter of a vacant see in England to proceed with a new election. Though nominally choosing their bishop, yet the dean and chapter are bound to elect, within a certain time, such person as the Crown shall recommend, otherwise they incur the penalties of a *præmunire*.

CONGER-EEL (kong'gẽr). A genus of marine eels characterized by a long dorsal fin beginning near the nape of the neck, immediately above the origin of the pectoral fins, and by having the upper jaw longer than the lower. The best-known member



Conger-eel (*Conger vulgāris*)

of this genus is the *Conger vulgāris*, which is abundant in all European waters, sometimes attaining a length of 10 feet and more than 100 lb. in weight. It is pale-brown above, greyish-white below, with withish dorsal and anal fins fringed with black. Its flesh is eaten, but is somewhat coarse.

CONGESTED DISTRICTS BOARD. A body under this name was established by the Irish Land Purchase Act, 1891, for the purpose of ameliorating the condition of the rural population dwelling in certain "congested" districts, the test of such congestion being that more than 20 per cent. of the population of the county were living in electoral divisions of which the total rateable value divided by the number of the population gave a sum of less than £1, 10*s*. for each individual. The board has power to amalgamate small holdings by aiding migration and emigration of occupiers from one holding to another, and generally to further agriculture, stock-rearing, fishing, weaving, spinning, or other suitable industries. The board has a considerable income, largely derived from the Irish Church Temporalities Fund. It has carried out important drainage and other works, and has made large purchases of land, including the Dillon estate of over 90,000 acres, bought for £290,000. The congested districts are chiefly in Connaught and in the south-west and north-west of Ireland. A similar board for Scotland was established in 1897, and, like the Irish board, has already spent a large amount of money on such works as piers, harbours, roads, and bridges. In 1911 the Scottish Land Court took over the work of the board for Scotland.

CONGESTION. In medicine, is a hyperæmia (excess of blood) in some part or organ of the body. Two forms are recognized, *active* and *passive*. The first is due to an increased amount of blood being brought to the part by the arteries, and the second occurs where there is delay in the return of the blood from a part due to obstruction of the veins.

Active congestion is characterized by increase in size of the affected part, the bright-red colour of the skin, with increased warmth frequently accompanied by throbbing and pulsation. This is seen in inflammatory conditions, or may be produced by the action of certain drugs, or when very tight pressure is applied to a limb.

Passive congestion is shown by the affected part becoming dark-purple in colour (cyanosis). Frequently it is cooler than the surrounding parts. When the congestion is long-standing, œdema (dropsy) appears in the dependent parts of the body and fluid in cavities, e.g. in the chest or abdomen. The effects of temporary congestion, when the cause of the congestion is removed, are wholly passing, and the part resumes its normal state, but long-standing passive congestion leads to permanent changes in the tissues.

CONG'LETON. A municipal borough of England, Cheshire, in a deep valley on the Dane, 24¼ miles S. of Manchester. It has cotton and silk manufactures, the latter forming the principal industry. Pop. (1931), 12,885.

CONGLOM'ERATE. A term applied by geologists to rocks consisting mostly of water-worn pebbles cemented together by a matrix of siliceous, calcareous, or other cement, often called also *pudding stone*. When their cement decays, they yield, as a rule, very unpromising and gravelly soils.

CONGO, or ZAIRE. One of the great rivers of the world, in Southern Africa, having its embouchure in the South Atlantic. The mouth of the river was known to the Portuguese in 1485, but the lower part of its course was first explored by an English expedition under Captain Tuckey in 1816, which ascended it for about 172 miles. In 1867, however, Livingstone discovered a con-

siderable river called the Chambezi, rising in the Chibalé Hills, and having followed it to Lake Bangweolo, traced it thence as the Luapula to Lake Moero, and thence again as the Lualaba to Nyangwe. From this point its exploration was taken up in 1876-77 by Stanley, who proved its identity with the Congo. It carries more water to the ocean than the Mississippi, its volume being next to that of the Amazon. Its total length is about 2800 miles, and it drains an area of 1,400,000 sq. miles. Its chief tributaries are the Aruwimi and the Mobangi from the right, and the Ikelemba and Kwa from the left, which latter represents the collected waters of immense rivers from the south, such as the Kassai, the Kwango, etc. It is navigable for about 100 miles from its mouth, after which the navigation is interrupted by cataracts.

CONGO, Belgian, formerly known as the **Congo Free State.** A Belgian territory on the River Congo, in Central South Africa, stretching by a kind of narrow neck of territory to the river's mouth, but expanding inland so as to cover an immense area, mainly lying south of the river. The obvious advantages of the Congo as a waterway in opening up the continent led to the formation at Brussels in 1878 of a Comité d'Études du Haut Congo, under the patronage of Leopold II., having as its aim the internationalization and development of the Congo area. As agent of this association Stanley returned in 1879 to open up the river and form a free state under European protection. He established a first station at Vivi, the limit of maritime navigation, 110 miles above the mouth of the river, constructed roads past the Yelala and Livingstone cataracts, and hauled steamers up to the higher reaches of the Congo, where in 1882 the station of Leopoldville was formed on Stanley Pool.

From its mouth to Matadi the Congo is navigable for about 100 miles, but above this numerous rapids render the river unnavigable as far as Stanley Pool. From the latter station, however, to Stanley Falls the Congo itself is continuously navigable for 1600 miles, to which its great affluents already explored add no fewer than 5000 miles of serviceable waterway. Above the Stanley Falls station the river is called Lualaba, and is again navigable for a distance of 600 miles.

The work having been initiated by Stanley, King Leopold's association in 1884-85 entered into treaties with all the European powers and the United States for the recognition of its sovereign power. A treaty with Japan was concluded in 1900. The boundaries of the new *Congo Free State* were practically settled at the same time, and it was agreed that the basin of the Congo and its tributaries should be free to all nations, that no duties should be levied on imports (this was not adhered to), and that the slave trade should be suppressed. The state became formally a Belgian colony on 18th Oct., 1908. The Central Government is at Brussels, under the Colonial Minister. In Africa there is a Governor-General with many officials, and an armed force. The territory is divided into twenty-two administered districts. A number of stations have been formed on the river, the chief being Boma, 70 miles from the mouth. Boma was the capital till 1923, but in that year Leopoldville became capital by Royal Decision. Others are Banana, Matadi, Leopoldville, and Stanleyville.

Copper-mining is important in the south-east, and radium, diamonds, and gold are mined. There are many missionaries at work. There are 1623 miles of railways, and large stretches of navigable waterways. The principal exports are palm-nuts, palm-oil, copper, ground-nuts, and copal. Area estimated at 918,000 sq. miles; native pop., 8,803,422; European pop. (1931), 25,179.

Belgium holds a League of Nations mandate for the administration of the territories of Urundi and Ruanda (formerly in German East Africa). These districts, which have an area of 21,235 sq. miles, are administered as integral parts of the Belgian Congo. Their capital is Usumbura. In 1927 Belgium ceded to Portugal a tract of 480 sq. miles in the extreme south-west of the Belgian Congo, in return for a cession by Portugal of a very small area near Matadi in the Congo estuary. Belgium further undertook to commence the construction of a railway to link up with the Portuguese railway. This railway was opened on July 1, 1931.—BIBLIOGRAPHY: A. J. Wauters, *Bibliographie du Congo*; Sir H. M. Stanley, *The Congo and the Founding of its Free State*; D. C. Boulger, *The Congo State*; J. Bertrand, *Le Congo Belge*; A. B. Keith, *The Belgian Congo and the Berlin Act.*

CONGO, French. *See* FRENCH EQUATORIAL AFRICA.

CONGO PEA. *See* PIGEON PEA.

CONGREGATIONALISTS, formerly called **Independents.** A Christian sect claiming to continue the primitive form of Church government; founded

by the moderate party among the Brownists and Barrowists early in the seventeenth century. Congregationalism was associated in its origin with Puritanism, of which it was the most radical expression. It is the doctrine of democracy applied to the Church.

Under the Commonwealth the Congregationalists rapidly developed, and though they suffered after the Restoration, in common with their rivals the Presbyterians, they speedily recovered after the Revolution, and soon outstripped the latter sect so far as England was concerned. The name Independent, as it was frequently adopted by other bodies with which they had no sympathy, was discarded in favour of the name of Congregational Brethren, which appeared to express a leading feature in their polity. This is the government of each congregation by all the members of that congregation, and not, as in the Presbyterian Church, by a session of the pastor and ruling elders only. Moreover, each congregation is autonomous and wholly independent of extraneous jurisdiction, the union of Congregational churches having only such indirect authority as attends the cumulative expression of opinion. In modern times, however, Congregationalism is displaying a centralizing tendency. In doctrine the majority are evangelical, though in individual churches considerable latitude is shown.

The number of Congregational churches and mission-stations in the British Islands is about 5000, of which more than 4500 are in England and Wales. The body has about 500,000 members, over 3000 accredited ministers and upwards of 300 evangelists, and it raises a sum of more than £1,000,000 annually for religious and charitable purposes. Congregationalism is also a leading form of Church life in many of the British dependencies and in the United States. The membership of the Congregational churches all the world over was 1,563,834 in 1920. The Pilgrim Fathers, who set sail in the *Mayflower* for the New World, were Brownists or primitive Congregationalists.—Cf. R. W. Dale, *History of English Congregationalism.*

CONGREGA'TIONS. In the Papal government, meetings or committees, consisting of cardinals and officers of the Pope, to administer the various departments, secular and spiritual, of the Papal dominion, e.g. the congregation of the Holy Office (Inquisition), the congregation of the Index, &c. Congregation also signifies a society of several convents of the same rule, which together form an organized corporation, hold chapters, and elect superiors.

CON'GRESS. In international politics, a meeting of the rulers or representatives of several states, with a view to adjusting disputes between different Governments. The term is only applied to gatherings of first-class importance, attended either by sovereigns or by their Secretaries of State; less important meetings for the settlement of particular questions or *in preparation* for a congress are usually termed conferences. The word, in this connotation, came into use in the seventeenth century.

CONGRESS. The name given to the legislative assembly of the United States of America, consisting of two Houses—a Senate and a House of Representatives. The Senate consists of two members elected by each state for a period of six years, one-third of whom are elected every two years. The representatives in the Lower House are elected by the several states every two years, and their number varies in each state in proportion to the population as determined by the decennial census. The united body of Senators and representatives for the two years during which the representatives hold their seats is called one Congress. *See* UNITED STATES.

CON'GREVE, William. English dramatist, born 1670, educated at Kilkenny, and at Trinity College, Dublin, from which he entered the Middle Temple, London. A novel entitled *The Incognita*, under the pseudonym of Cleophil, was followed, at the age of twenty-one, by his comedy of *The Old Bachelor*, the success of which procured for him the patronage of Lord Halifax, who made him a commissioner for licensing hackney-coaches; soon after gave him a place in the pipe office; and finally conferred on him a very lucrative place in the Customs. He afterwards received an additional sinecure in the appointment of secretary to the Island of Jamaica.

His next play, *The Double Dealer*, was less successful: his third comedy *Love for Love*, and his tragedy, *The Mourning Bride* (1697), were both popular; but after the cold reception of his *Way of the World*, in 1700, he ceased altogether to write for the stage, though he still wrote occasional verses on public subjects. In 1710 he published a collection of his plays and poems, which he dedicated to his early patron, Lord Halifax, to whose person and party he remained attached in all fortunes. He died in 1729.

Congreve is thought by many competent critics to be the greatest English master of pure comedy. Unfortunately for him, his work has often been associated with the coarse and brutal work of Wycherley, with whom he has really little in common. His plays, especially *The Way of the World*, are masterpieces, and rank with all Molière's plays, except his very greatest.—Cf. Edmund Gosse, *The Life of William Congreve*.

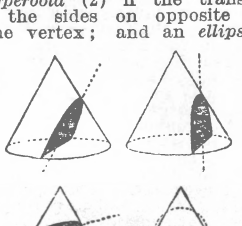
CONGREVE, Sir William, Bart. Inventor of the Congreve rocket, born in 1772, died at Toulouse in 1828. He entered the army, from which he retired in 1816 with the rank of lieutenant-colonel of artillery and entered the House of Commons. He invented the rocket about 1804. It was first used on active service in the attack on Boulogne, 1806, and on Copenhagen, 1807. He took out patents also for the manufacture of gunpowder and of bank-note paper, and wrote treatises on the mounting of naval ordnance and on the hydro-pneumatic lock.

CONGRUENCE. In algebra, the set of whole numbers which leave the same remainder on being divided by a given whole number are said to form a congruence, or to be congruent, with respect to the given number, which is called the modulus of the congruence. In geometry, a set of lines that satisfy two conditions, so that a finite number pass through a point and a finite number lie on a plane, are said to form a congruence of lines.—*Congruent*, a term applied to two figures which may be made to coincide exactly by superposition.

CONI, or CU'NEO. A town of North Italy, capital of the province of Coni, charmingly situated on a hill, at the confluence of the Stura and the Gesso, 47 miles S. of Turin. Formerly all merchandise passing from the seaport of Nice to Lombardy, Switzerland, and Germany went by this route, but the railway has confined its trade to Turin and neighbouring towns. It has manufactures of silks and woollens. Pop. (commune), 32,512.

CONIA, CONIINE, or CICUTINE (from Lat. *conium*, Gr. *kōneion*, hemlock) ($C_8H_{17}N$). A volatile alkaloid, the active poisonous principle of hemlock. It exists in all parts of the plant, but especially in the not quite ripe seed. When pure it is a colourless oily liquid, sp. gr. 0·845 at 20° C., changing by exposure to air to a brown fluid, and ultimately to a resinous bitter mass. It is one of the few alkaloids which have been prepared synthetically, and is a derivative of pyridine. It has a nauseous taste and very disagreeable odour, sharp and choking when strong, but in small quantity like that of mice. It is exceedingly poisonous, appearing to cause death by inducing paralysis of the muscles used in respiration.

CONIC SECTIONS. Three curves, the *hyperbola*, the *parabola*, and the *ellipse*, formed by the intersection of a right circular cone with planes that cut the cone in various directions. Let a plane, P, be drawn through the axis of the cone at right angles to the plane of section, Q. Let the lines in which P cuts the cone be called the *sides*, and the line of intersection of P and Q the *transverse*. Then the curve in which Q cuts the cone is called a *parabola* (1) if the transverse is parallel to a side; a *hyperbola* (2) if the transverse cuts the sides on opposite sides of the vertex; and an *ellipse* (3)



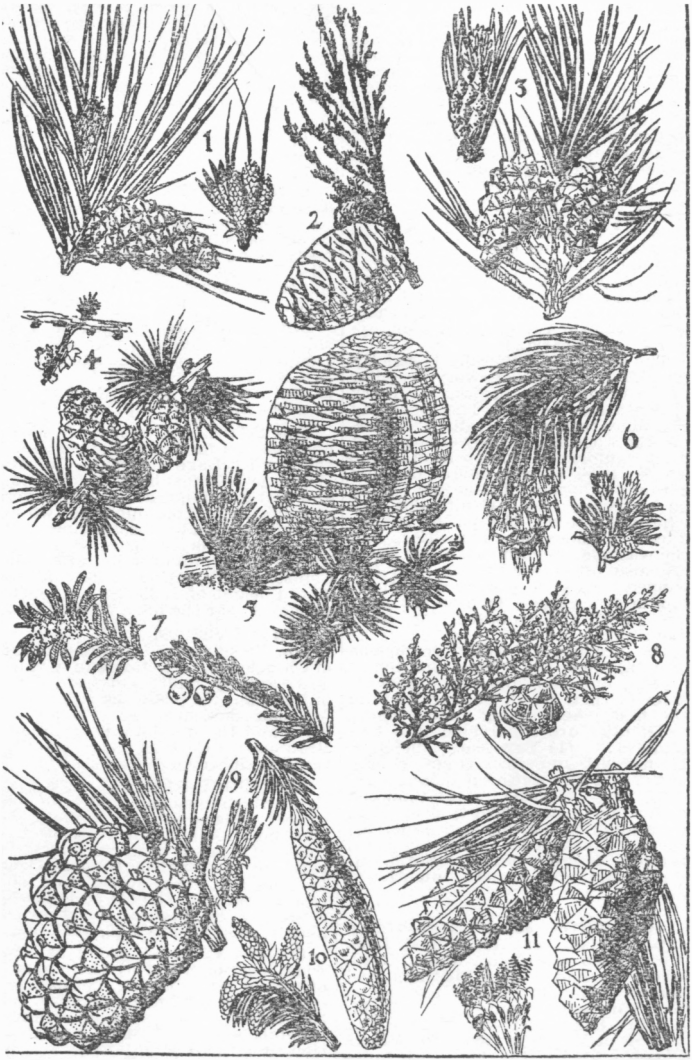
Conic Sections

1, Parabola. 2, Hyperbola. 3, Ellipse. 4, Circle.

if the transverse cuts the sides on the same side of the vertex. The ellipse becomes a circle (4) when Q is at right angles to the axis of the cone. The curves may also be obtained as plane sections of an oblique circular cone. (*See* GEOMETRY (ANALYTICAL).) The definition of the curves as sections of a cone is the one which was used by ancient geometers; later they were defined as the loci of points which move so that their distance from a fixed point (focus) is in a constant ratio to their distance from a fixed straight line (directrix). If this ratio (e) is greater than 1, the curve is a hyperbola; if less than 1, the curve is an ellipse; if e is equal to 1, the curve is a parabola.

CONIDIUM. In Fungi, an asexually produced wind-borne spore, budded off from the end of a special hypha or *conidiophore*.

CONIFERALES, CONIFERÆ, or CONIFERS. The largest and most



Corsican Pine. 2, Sequoia Wellingtonia. 3, Scotch Fir. 4, Larch. 5, Cedar. 6, Douglas Fir. 7, Yew. 8, Cypress. 9, Stone Pine. 10, Spruce Fir. 11, Cluster Pine.

important group of living gymnosperms, so-called from their cones, which are commonly of the type seen in the Scotch pine. They are all woody plants, and mostly tall evergreen trees (the larch is a deciduous conifer) of temperate and arctic zones and of high tropical mountains. Immense coniferous forests exist in the north temperate zone (firs, spruces, larches, pines), also on the Pacific slope of North America—the home of the mammoth trees (Sequoia), Douglas fir (Pseudotsuga), sugar pine, etc.—and in the Himalayas (deodar and blue pine), while many peculiar types are found in China and Japan, e.g. umbrella pine (Sciadopitys), in Australia and New Zealand, e.g. kauri pine (Agathis), and in South America, e.g. monkey-puzzle (Araucaria).

The shoot of Coniferales is strictly monopodial and of very regular construction (as in an ordinary "Christmas tree"). The anatomy resembles that of woody dicotyledons, but the wood is generally simpler and more uniform in composition. The leaves are always more or less xerophytic, the pine-needle being an extreme case. Coniferales are wind-pollinated; the pollen is produced in incredible quantities, and the wastage is enormous. The seeds are also often wind-borne, e.g. the winged seeds of the Scotch pine; but in other cases, such as the yew, are juicy and adapted for bird-dispersal.

On account of their gregarious growth, their tall, clean, yet bulky trunks, and the homogeneous character of their wood, Coniferales take the first place among timber trees. Coniferales are subdivided into two families: (1) Taxaceæ, dicœious plants with imperfect cones, chiefly natives of the southern hemisphere, e.g. yew (Taxus); (2) Pinaceæ, moncœious plants with typical cones concealing the seeds, e.g. pine, fir, spruce, mammoth tree, cypress, juniper, monkey-puzzle. *See* GYMNOSPERMS and genera mentioned above.

CONINGTON, John. English classical scholar, born 1825, died 1869. He studied at Rugby and Oxford, where he had a most distinguished career, and held the Latin chair in the university from 1854 till his death. His chief work was an edition of Virgil (in Bell's *Bibliotheca Classica*, 3 vols., 1861-68), with notes and introductory essays; and he also translated Virgil's *Æneid* (in the octosyllabic metre of Scott); part of Homer's *Iliad*; and the *Odes*, *Satires*, and *Epistles* of Horace. His translation of Virgil is most imperfect, as the galloping metre he adopted is as different as possible from the weighty and dignified Virgilian hexameter; but his translation of Horace is admirable in every respect, and is easily the best complete version in English, though Calverley has perhaps given a happier rendering of one or two individual odes.

CONIROS'TRES. In ornithology, a subdivision of the ord. Insessores or Passeres, consisting of genera having a stout conical beak. The best-known genera are the larks, tits, finches, sparrows, goldfinches, linnets, bullfinches, crossbills, starlings, crows, and birds of paradise.

CONISBROUGH. Town of Yorkshire (West Riding). It stands on the Don, 5 miles from Doncaster, on the L.N.E. Railway. The chief industry is coal mining. The town has ruins of a castle. Pop. (1931) 18,179.

CON'ISTON. A name of several applications in North Lancashire, in the English Lake District. Coniston Water is a lake about 6 miles long and half a mile broad, fed by several streams, on one of which are two fine waterfalls, and discharging into Morecambe Bay. It is overlooked by the fine group of mountains called Coniston Fells, rising in the Old Man to the height of 2633 feet. Coniston village is near the head of the lake.

CONJÉE'VERAM. A town of India, Presidency of Madras, district of Chingleput. It stands in a valley, is irregularly built, and from 5 to 6 miles long. It possesses two famous pagodas dedicated to Vishnu and Siva, and the inhabitants are mostly Brahmans. Cottons are manufactured in the town. Pop. 61,376.

CON'JUGAL RIGHTS. In law, the right which husband and wife have to each other's society, comfort, and affection. A suit for restitution of conjugal rights is competent by either party in the English Divorce Court. In England the jurisdiction was transferred from the old ecclesiastical courts to the Divorce Court by the Matrimonial Causes Act, 1857.

CONJUGATÆ. A group of Green Algæ, characterized by their method of sexual reproduction, consisting in conjugation of similar gametes, each the entire contents of an ordinary vegetative cell, through a conjugation-tube. *See* SPIROGYRA.

CONJUGATE DIAMETERS. In the geometry of conic sections, two diameters such that the pole of either lies on the other. Each bisects chords parallel to the other.

CONJUNC'TION. In grammar, a connective indeclinable particle serving to unite words, sentences, or clauses of a sentence, and indicating their relation to one another. They are classifiable into two main groups: (1) co-ordinating conjunctions, joining independent propositions, and subdivisible into copulative, disjunctive, adversative, and illative conjunctions; (2) subordinating conjunctions, linking a dependent or modifying clause to the principal sentence. The only active influence which the conjunction can be said to exercise grammatically in a sentence is in respect of the mood of the verb following it in dependent sentences, the rule being to employ the subjunctive where futurity and contingency are implied, the indicative where they are not; as "I will do it, though he be there" (which he may or may not be); or "I will do it, though he is there" (which he is).

CONJUNC'TION. In astronomy, the position of two of the heavenly bodies, as two planets, or the sun and a planet, when they have the same longitude, that is, when their directions projected on the ecliptic or earth's orbital plane coincide. Sometimes conjunction in right ascension instead of longitude is spoken of, the directions being then projected on the plane of the equator. When it is simply said that a planet is *in conjunction*, conjunction with the sun is to be understood. Venus or Mercury is said to be *inferior* conjunction when precisely on the same side of the sun as the earth, in *superior* conjunction when on the opposite side.

CONJUNCTI'VA. The membrane which lines the inner surface of the eyelids and which is continued over the fore-part of the globe of the eye.

CONJUNCTIVITIS. Inflammatory condition of the conjunctiva, or mucous membrane lining the eyelids. **Keratitis,** or **Purulent Conjunctivitis,** has a marked purulent discharge, while the conjunctiva becomes very inflamed and swollen, and the patient complains of great pain in the eye. Medical aid must be called immediately; for temporary relief until the doctor arrives the eye may be bathed with boracic lotion, but great care must be taken to prevent the other eye from becoming affected.

When conjunctivitis is caused by exposure to cold, the symptoms are much less severe, and the discharge is non-purulent. It may be treated by bathing with boracic lotion. If the inflammation continues, medical aid should be called in.

CON'JURING. Was known and practised at a very early date in Egypt and in ancient Greece and Rome, and many seemingly inexplicable effects were produced in much the same manner as in modern days. Artificial thunder and lightning presented no serious difficulties; while the visibility of apparitions was effected by painting the figures on a dark wall in some easily inflammable material and igniting it. Considerable skill was, however, often employed.

At later periods both Chaucer and Cellini seem to have been familiar with conjuring exhibitions. Pepper's ghost and numerous similar phenomena resulted from the arrangement of mirrors and a knowledge of acoustics, and the use of ventriloquial skill will effect much. Electromagnetism is another valuable assistant to the conjurer. Maskelyne's famous box-trick formed one of the sensations of the nineteenth century, and equally successful in the presentation of illusions was de Kolta. India has long been the home of conjuring. Skill of hand and much practice are needed by the conjurer, with a flow of "patter" to distract the attention of his audience during critical moments of the trick performed.

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CONN, Lough. A lake in the north of County Mayo, Ireland, separated from Lough Cullin by a narrow channel. The two extend for about 13 miles, and are studded with islands.

CONNAH'S QUAY. A seaport and urban district of North Wales, in Flintshire, on the estuary of the Dee. Pop. (1931), 5982.

CONNAUGHT, Arthur William Patrick Albert, Duke of. Third son of Queen Victoria, was born in 1850. Intended for the army, he was educated at the Royal Military Academy, Woolwich, and entered the Royal Engineers in 1868. In 1874 he was created Duke of Connaught and Strathearn, and in 1879 he married Princess Louise, daughter of Prince Frederick Charles of Prussia. He saw service in Canada, Egypt (at the battle of Tel-el-Kebir in 1882), and in India (1886-90). In 1902 he was made a field-marshal, was Inspector-General of the Forces from 1904 to 1907, and commander-in-chief in the Mediterranean from 1907 to 1909.

He was Governor-General of Canada from 1911 to 1916, being succeeded by the Duke of Devonshire. In 1920 he visited India, and opened the new Legislative Assembly there in 1921.

CONNAUGHT, Prince Arthur of. Son of the preceding, was born in 1883. He was educated at Eton, and entered the Hussars in 1901. During the European War he served as aide-de-camp to the commander-in-chief, and was sent on special missions abroad. In 1913 he married Alexandra, Duchess of Fife, daughter of the Princess Royal. From 1920 to 1923 he was Governor-General and commander-in-chief of the Union of South Africa.

CONNAUGHT (kon'nat). The smallest of the four provinces of Ireland, situated between Leinster and the Atlantic; area, 4,230,882 acres. Its west coast is much broken up by numerous bays and inlets, and is thickly studded with islands. The central parts are comparatively level and of limestone formation, while the surrounding mountains are formed of sandstone, clay-slate, granite, and quartz. A large proportion of the province is bog, and, generally, it is the least fertile of all the provinces. It is divided into five counties—Galway, Mayo, Roscommon, Leitrim, and Sligo. Pop. (1926), 552,907.

CONNAUGHT RANGERS, The. Raised (1703) in the Irish province from which they are named, greatly distinguished themselves at Busaco, routing a French regiment five times their own strength. During the European War the Connaughts suffered heavy losses on the Western Front at Pont-sur-Sambre, and were also represented in Gallipoli.

CONNECTICUT (kon-net'i-kut). A river, United States, the west branch of which forms by treaty the boundary between the United States and Canada to lat. 45° N. It rises on the north border of New Hampshire; forms the boundary between Vermont and New Hampshire, passes through the west part of Massachusetts and the central part of Connecticut, and falls into Long Island Sound. It is navigable for vessels drawing from 8 to 10 feet for about 300 miles from its mouth, subsidiary canals, however, being required above Hartford; total length, 400 miles. It is famed for its shad fisheries.

CONNECTICUT. One of the original thirteen states of the American Union; bounded by New York, Massachusetts, Rhode Island, and Long Island Sound; length, east to west, about 95 miles; greatest breadth, north to south, about 72 miles; area, 5110 sq. miles, of which 145 sq. miles is water area. It contains several distinct ranges of hills, but none of them have any great elevation. Its principal river is the Connecticut, which divides it into two nearly equal parts. The coast is indented with numerous bays and creeks, which furnish many harbours.

Its minerals comprise iron, copper, lead, cobalt, plumbago, marble, freestone, porcelain-clay, and coal. Lime is produced in large quantities, and there is abundance of building-stone.

The soil is in general better suited for grazing than tillage, abounding in fine meadows. But where agriculture is practised there are ample crops of Indian corn, rye, wheat, oats, barley, buckwheat, and potatoes; and fruits, particularly apples, flourish.

The manufactures consist chiefly of woollen, cotton, and silk goods, metal goods, paper, clocks, hats and caps, leather goods, pottery-ware, glass, and machinery, firearms, sewing-machines, soap, candles, bricks, carriages, etc. The principal exports consist of agricultural produce and manufactures. The foreign commerce is nearly all carried on through New York and Boston, but there is a considerable coasting-trade, and a large amount of tonnage engaged in the cod-fisheries. Fish-culture has received special attention, many millions of shad ova and young salmon having been introduced into the rivers.

The state is intersected in various directions by railways. The chief educational institution is Yale University, New Haven, founded in 1701, one of the most celebrated in the United States. It had, in 1930–31, 754 professors and teachers, and 5290 students. Wesleyan University, Middletown, was founded in 1831. The seat of government is Hartford. The largest town is New Haven. Other populous places are Bridgeport, Waterbury, and Meriden. The state at first consisted of two colonies—Connecticut, with its seat of government at Hartford; and New Haven, at New Haven.

Connecticut was settled in 1633 by emigrants from Massachusetts. Hartford was settled by English in 1635, the Dutch having previously built a fort there. The colony of New Haven was settled by English in 1638, and the two colonies were united in 1665 by a charter granted by Charles II. Pop. 1,606,903.

CONNECTIVE TISSUE. *See* AREOLAR TISSUE.

CONNEMA'RA ("the Bays of the Ocean"). A boggy and mountainous district occupying the west portion of County Galway, Ireland; about 30 miles in length and 15 to 20 miles in breadth. Its coasts are very broken, and there are numerous small lakes. There is much wild and picturesque scenery. Many of the people support themselves by fishing. Connemara ponies, which are famous, have sprung from the small horses which reached the British Isles in prehistoric times. Connemara gives its name to a parliamentary division of County Galway.

CONNING TOWER. Armoured structure on a warship used for observation and steering. In a submarine the conning tower is fitted with hatches at the bottom and on a level with the bridge for use when submerging.

CONNOTATION. A term used by John Stuart Mill to describe the sum total of the attributes or qualities involved by the name of any object or question under discussion. True connotation can exist between two or more persons discussing any question only when all are acquainted with the full number of its various qualities—as, taking slavery for an example, that such a condition involves absence of personal freedom, forced labour, treatment as a chattel, liability to be bought or sold, etc. The absence of such connotation must cause error or dispute, and, in the case of public questions, often proves disastrous.

CONODONTS. Minute pointed fossil bodies, resembling in form the teeth of sharks, but without their characteristic dental structures. They are found in marine strata throughout the Palæozoic group, and are now regarded as the teeth of worms. They are composed of calcium carbonate, with only a trace of calcium phosphate.

CO'NOID. In geometry, a term applied particularly to the solid formed by the revolution of the parabola and hyperbola about their axes; more generally a solid body shaped like a cone.

CONOLLY, John. English physician, son of an Irish father, was born in Lincolnshire in 1794, and died in 1866. He became an officer in the militia, married, and then studied medicine, graduating at Edinburgh in 1817. He practised for five years at Stratford-on-Avon, was from 1827 to 1830 in London, then removed to Warwick, and in 1839 was appointed resident physician to the Middlesex Asylum at Hanwell, where he introduced the rational and humane treatment of the insane, discarding all forms of mechanical restraint, and helping largely to bring about the revolution in lunatic asylum management that now took place. His connection with the Middlesex Asylum ceased in 1852. He subsequently owned a private asylum. He was the author of *Construction and Government of Lunatic Asylums* and of several other works.

CO'NON. An Athenian general who had the command of a fleet in 413 B.C., intended to prevent the Corinthians from relieving Syracuse, then at war with Athens, and who, after various services, succeeded Alcibiades in 406. When the Athenian fleet was surprised and defeated by the Spartans under Lysander in 405, shortly before the end of the Peloponnesian War, Conon escaped to Cyprus with eight vessels, and afterwards joined the Persians against the Spartans, being appointed to the command of a Persian fleet in 397.

In 394, in concert with the Persian commander, Pharnabazus, he defeated the Spartan admiral Pisander off Cnidus, and in 393 he returned to Athens to restore the walls and fortifications, a work in which he employed the crews of his vessels, rousing great enthusiasm among the Athenians, his countrymen. But having been sent by the Athenians to counteract the effects of Spartan diplomacy upon the Persians, he was thrown by the latter into prison, and his subsequent fate is unknown, some believing that he was put to death, others that he escaped and died in Cyprus in 390.

CONOSCOPE. An arrangement of lenses fitted to a microscope, whereby minerals may be viewed in convergent in place of parallel rays of polarized light. The characteristic "rings and brushes" of uniaxial and biaxial minerals may thus be studied in sections cut in known directions.

CONQUEST. In feudal law, a name applied to purchase or any other means of acquiring property than by the common course of inheritance. It is a term in Scots law, according to which, previous to the Conveyancing Act, 1874, the descent of property to heirs, in cases of intestacy, might depend upon whether it was originally acquired by conquest or by inheritance (succession). The distinction is sometimes adhered to in provisions inserted in marriage contracts.

CON'RAD, Joseph. British novelist, born in 1856. The son of a Polish revolutionary, his real name being Konrad Korzeniowski, he passed his youth in Poland and the Ukraine. At the age of thirteen he came to Marseilles, where he joined the French merchant navy. In 1878 he landed at Lowestoft, subsequently became a mate on an English ship, and a master in 1884. Although he learned English rather late in life, he nevertheless acquired a wonderful style, strong and idiomatic. His works, remarkable for their vivid description of seafaring life, include: *Almayer's Folly*; *An Outcast of the Islands*; *The Nigger of the Narcissus*; *Tales of Unrest*; *Lord Jim*; *The Inheritors* and *Romance*, both with F. M. Hueffer; *Typhoon*; *The Mirror of the Sea*; *Youth*; *Nostromo*; *The Secret Agent*; *The Shadow Line*; *A Set of Six*; *Within the Tides*; *Under Western Eyes*; *'Twixt Land and Sea*; *Chance*; *Victory*; *The Arrow of Gold*; *A Personal Record*; *The Rescue*; *The Rover*; and *Suspense*. He wrote one play, *One Day More*. He died in 1924.

CON'RAD I. King of the Germans or German Emperor, Count or Duke of Franconia, was chosen by the German princes as their head in 911, on the extinction of the direct Carlovingian line. He had difficulty in establishing his imperial authority over insubordinate vassals, had to contend against the Hungarians, in fighting against whom he was mortally wounded in 918.

CONRAD II. King of the Germans and emperor of the Romans, reigned from 1024 to 1039, and is regarded as the true founder of the Franconian or Salic line. On his election he proclaimed a *God's Truce* in order to attempt certain reforms in the kingdom; but his attention was too distracted between Italy and Germany for him to do more than repress some of the more marked evils of the feudal system.

CONRAD III. King of the Germans and emperor of the Romans from 1138 to 1152, was the founder of the Suabian dynasty of Hohenstaufen. During the struggle with his rival, Henry the Proud, the factions of Guelf and Ghibelline, named from the war-cries of the respective parties, came into existence. Conrad, persuaded by St. Bernard, took part in the second Crusade, from 1147 to 1149. His marriage with a Greek princess led to his adoption of the double-headed eagle afterwards appearing on the Austrian arms. He was succeeded by his nephew, Frederick Barbarossa.

CONSALVI, Ercŏle. Cardinal and Prime Minister of Pope Pius VII., born in 1757. He became secretary of Cardinal Chiaramonti, and when his patron was elected Pope (Pius VII.) became one of the first cardinals, and afterwards Secretary of State. In this capacity he concluded the famous concordat with Napoleon in 1801. In 1806 he went into retirement, but in 1814 became Papal minister at the Congress of Vienna, and up till the death of Pius VII. he remained at the head of Roman political and ecclesiastical affairs. He died in 1824.

CONSANGUIN'ITY. The relation of persons descended from the same ancestor. It is either lineal or collateral—lineal between father and son, grandfather and grandson, and all persons in the direct line of ancestry and descent, from one another; collateral between brothers, cousins, and other kinsmen descended from a common ancestor, but not from one another. The laws of inheritance are regulated in a great measure according to consanguinity, but they vary considerably in different jurisdictions.

Consanguinity, in animals, is the result of inbreeding. The pairing of nearly related animals is often practised, especially when an attempt is being made to "fix" some desirable new variation.

CONSCIENCE. That power or faculty, or combination of faculties, which decides on the rightness and wrongness of actions; otherwise called the **Moral Sense.** It is the recognition by the individual of the moral value of character or conduct, of the ultimate moral laws upon which moral judgments rest, together with the consciousness of merit or guilt. Conscience, therefore, being the name for the function of distinguishing between right and wrong, is a term for ethics, while consciousness is one for psychology. Whewell defines it as "the reason, employed about questions of right and wrong, and accompanied with the sentiments of approbation and condemnation, which, by the nature of man, cling inextricably to his apprehension of right or wrong." *See* ETHICS.—**Conscience Clause**, a clause in an act or law relieving persons who object on religious grounds to do something enjoined in the act or law from any penalty to which they would otherwise be liable.

CONSCIENCE (kōn-syăns), **Hendrik.** Flemish novelist, born at Antwerp, 1812, died 1883. Having educated himself, he taught for a short time in a school, and then served in the

army for six years. He was for a time tutor in Flemish to the royal princes, and from 1868 conservator of the Wiertz museum at Brussels. Some of his novels are based on the history of his country, others are pictures of everyday Flemish life. They include: *The Lion of Flanders*, *Jakob van Artevelde*, *Batavia*, *Wooden Clara*, *Blind Rosa*, *The Poor Nobleman*, *The Young Doctor*, and *Maternal Love*. He also wrote a *History of Belgium*.

CONSCIENTIOUS OBJECTORS. A term applied in Great Britain during the European War to all those who, after the passing of the Compulsory Service Act in 1916, refused military service on religious or conscientious grounds. The local tribunals set up for the purpose granted exemption to some objectors, whilst others were required to do work of national importance. Many were sent to the army, court-martialled or imprisoned for disobedience. Those of the conscientious objectors who had not done any work of national importance were disfranchised for five years in 1918, under the Representation of the People Act.

CONSCIOUSNESS. A term used in its widest sense to denote the mind's knowledge or cognizance of its own action. It thus includes all our sensations, thoughts, feelings, and volitions—in fact, the sum total of our mental life. Conscious life is contrasted with the unconscious state of a swoon, or of a deep, dreamless sleep. Consciousness is the subject-matter of phenomenal and empirical psychology. *See* PSYCHOLOGY.

CONSCRIPTION. The enlisting of the inhabitants of a country capable of bearing arms, by a compulsory levy, at the pleasure of the Government, being thus distinguished from *recruiting*, or voluntary enlistment. The word and the system were both introduced into France in 1798 by a law which declared that every Frenchman was a soldier, and bound to defend the country when in danger. Excepting in times of danger it provided that the army should be formed by voluntary enrolment or by *conscription*. The conscription included Frenchmen from twenty years of age complete to twenty-five years incomplete. On the restoration of the Bourbons conscription was abolished. It was, however, re-enacted, and continued through the Second Empire to form the mode of recruitment in France. A French Act, passed in 1872, and other subsequent enactments, affirm the universal liability to conscription upon all males not physically incapacitated, who have completed their twentieth year. The term of service was reduced to two years in 1905, but increased to three in 1913.

Universal liability to military service is also the law in Italy, Denmark, Norway, Greece, Japan, and other countries, the period at which liability begins being usually on the completion of the twentieth or the twenty-first year, while the total length of service varies, as does also the period of service in the active army, and the various reserves or other bodies. Though all young men arriving at a certain age may be liable for service, it does not follow that all will be called upon to serve, since the number of soldiers deemed needful for the standing army may be made up by drafting in a portion of those liable, or by voluntary enlistment.

In the Netherlands it is partly voluntary and partly compulsory. Before the revolution (1918) in Germany and Austria, military service was universal and compulsory in these countries. In 1918 the Republican Government of Russia established a Workers' and Peasants' Red Army of Volunteers. In Great Britain the militia was obtained, if necessary, by conscription, but until 1916 the rule was voluntary enlistment. Conscription was introduced into Great Britain by the Military Service Act, 1916; it applied to men from eighteen to forty years of age. Under the Military Service Act, 1918, the age for compulsory service was raised to fifty years for men in general. The last Act came into force on 18th April, 1918; it ceased to be valid, however, in April, 1920. In the United States the voluntary system prevailed, but in 1916 the principle of universal obligatory service was also adopted.—BIBLIOGRAPHY: Cliffe Leslie, *Essays in Political and Moral Philosophy*; Sir Ian Hamilton, *Compulsory Service*; Earl Roberts, *Fallacies and Facts*; R. C. Lambert, *The Parliamentary History of Conscription in Great Britain*.

CONSECRATION. The dedication with certain rites or ceremonies of a person or thing to the service of God; especially (1) the ordination of a bishop or archbishop, which requires the co-operation of at least three bishops; (2) the dedication of a church to God's service, which is practised in the Anglican and Roman Catholic Churches and is performed by a bishop; (3) the act of the priest in celebrating the eucharist by which the elements are solemnly dedicated to their sacred purpose.

CONSENT'. In law, understood to be a free and deliberate act of a rational being. It is invalidated by any undue means—intimidation, improper influence, or imposition—used to obtain it. Idiots, pupils, etc., cannot give legal consent; neither can persons in a state of absolute drunkenness, though partial intoxication will not afford legal ground for annulling a contract.

CONSEQUEN'TIAL DAMAGES. In law, such losses or damages as arise out of a man's act, for which, according to a fundamental principle in law, he is answerable if he could have avoided them.

CONSERVATIVE. Name of a political party in Great Britain, now officially known as Unionist. As a party label it took the place of Tory early in the nineteenth century, and towards the end, owing to the adherence of the Liberal Unionists opposed to Home Rule for Ireland, was changed to Unionist.

The **Conservative Party** stands for conserving, or preserving, the institutions of the country, especially the crown and the established church. It is in general suspicious of large reforms and is the party with agricultural interests. It enjoyed political power under Sir Robert Peel (1841-46), formed three short ministries under Lord Derby, and was in power under Lord Beaconsfield (1874-80) and Lord Salisbury (1895-1902).

The **Conservative Club** is a London club confined to members of the party. Its house is at 74 St. James's Street, S.W.1.

CONSER'VATORY. A name given on the European continent to a systematic school of musical instruction. In Britain the term is usually applied to foreign schools of music. Conservatories were originally benevolent establishments attached to hospitals, or other charitable or religious institutions. In Naples there were formerly three conservatories for boys; in Venice four for girls; the Neapolitan group being reduced in 1818 to a single establishment under the name Royal College of Music. In Milan a conservatory was established in 1808. In France the musical school established in connection with the Opera received its final organization in 1795 under the name of *Conservatoire de Musique*. Among its teachers have been Méhul, Cherubini, Grétry, and Boieldieu. The Conservatorium, founded at Leipzig in 1842 under the auspices of Mendelssohn, is perhaps the most influential in Germany, though of late years other schools have pressed closely upon it. Institutions of the same description exist in Warsaw, Prague, Munich, Berlin, and Vienna. In England the functions of a conservatory have been discharged the Royal Academy of Music (London, 1822), the Royal College of Music (1882), the Guildhall school and other institutions.

CONSERVATORY. In gardening, a term generally applied by gardeners to plant-houses, in which the plants are raised in a bed or border without the use of pots, the building being frequently attached to a mansion. The principles of their construction are in all respects the same as for the greenhouse, with the single difference that the plants are in the free soil, and grow from the floor instead of being in pots placed on shelves or stages. The distinction, however, is often overlooked.

CON'SERVE. A form of medicine in which flowers, herbs, fruits, roots are preserved as nearly as possible in their natural fresh state.

CONSETT. A town (urban district) of England, County Durham, 11¼ miles N.W. of Durham, with extensive ironworks and coal-mines. Pop. (1931), 12,251.

CONSIDERA'TION. In law, the reason or substantial ground which induces a party to enter into a contract; the equivalent for something given, done, or suffered. It may be either expressed or implied, that is, where justice requires it and the law implies it. *See* CONTRACT.

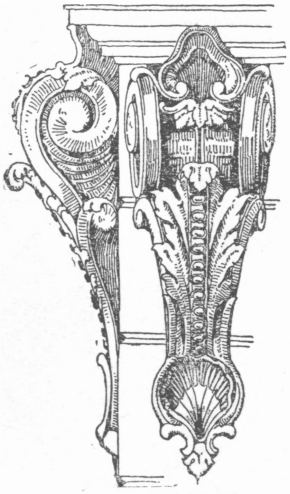
CONSIGN'MENT. A mercantile term which means either the sending of goods to a factor or agent for sale, or the goods so sent. The term is chiefly used in relation to foreign trade. The receivers of consignments have usually to keep warehouses and stores, for the use of which their consigners are charged. The profits of a consigning agency often compare favourably with the occasionally larger but much less safe profits of original ventures. The consigning trade is protected by special laws. In most countries a consigner can claim his goods and collect all outstanding debts for goods sold on his account by a consignee who has suspended payment. *See* AFFREIGHTMENT.

CON'SISTORY. The highest Council of State in the Papal Government. They are of three kinds: secret or ordinary, public or extraordinary, and semi-public. The name is also applied to the court of every diocesan bishop, and to the courts of the German Lutheran churches and of the Protestant churches of France.

In the English Church the consistory is held by the bishop's chancellor or commissary and by archdeacons and their officials either in the cathedral church or other convenient place in the diocese. In the Reformed (Dutch) Church the consistory, corresponding to the session of a Presbyterian church, is the lowest ecclesiastical court.

CONSOLA'TO DEL MARE (It., literally "the consulate of the sea"). A celebrated collection of maritime customs and ordinances of various Italian cities, as Venice, Genoa, Pisa, and Amalfi, together with those of the cities with which they traded, as Barcelona, Marseilles, etc. It has formed the basis of most of the subsequent compilations of maritime laws. The name is derived from the fact that it embodied the rules followed by the commercial judges, known generally as Consuls. The book was first published at Barcelona in 1494.

CON'SOLE. In architecture, a projecting ornament or bracket having



Console. Style of Louis XV
Side and front elevations

for its contour generally a curve of contrary flexure. It is employed to support a cornice, bust, vase, or the like, but is frequently used merely as an ornament.

CONSOL'IDATED FUND. The fund which receives the produce of the permanent taxes and other sources of revenue of Great Britain and Ireland, originally formed in 1787 by the union of certain separate funds. "Consolidated Fund Services" are those payable out of their permanent fund and not subject to annual grant by Parliament. Their security is therefore guaranteed, and the officials so paid are above ordinary parliamentary control.

The fund is liable from time to time to have specific charges thrown upon it by Parliament; it is pledged for the payment of the interest or part payment of the whole of the national debt of Great Britain and Ireland, and after defraying the specific charges assigned to it the surplus is applied indiscriminately under the direction of Parliament to the public service. The stated charges upon the consolidated fund, besides the national debt, are the Civil List, pensions, annuities, salaries of the judges and of certain officials, the expenses of the courts of justice, and miscellaneous charges. *See* NATIONAL DEBT.

CON'SOLS, or **CONSOLIDATED ANNUITIES.** A public stock forming the greater portion of the national debt of Great Britain. It was formed in 1751 by an Act consolidating several separate stocks bearing interest at 3 per cent. into one general stock. At the period when the consolidation took place the principal of the funds united amounted to £9,137,821; but through the addition of other loans it has increased so much that it now forms by far the greater portion of the national debt. The average price of £100 consols was £74, 16*s.* 10½*d.* in 1914, £59, 10*s.* in 1918, £51 . 13*s.* 6*d.* in 1919 (August), £47, 10*s.* in 1920, £57, 0*s.* 3*d.* in 1931, and in 1932 (Oct.), £75, 14*s.* 3*d.* The interest on a small portion is payable in Dublin, that of the remainder in London. *See* NATIONAL DEBT.

CON'SONANT (Lat. *con*, with, *sonare*, to sound). A letter so named as being sounded only in connection with a vowel, though some consonants have hardly any sound even when united with a vowel, serving merely to determine the manner of beginning or ending the vowel sounds; as in *ap*, *pa*, *at*, *ta*. In uttering a consonant there is greater or less contact of some parts of the organs of speech; in uttering a vowel there is a want of such contact, the vocal passage being open though variously modified.

CONSPIR'ACY. In law, an offence ranked as a misdemeanour, and punishable by imprisonment and hard labour. It is constituted by a

combination between several persons to carry into effect any purpose injurious either to individuals, particular classes, or the community at large. When the conspiracy leads to any overt act of an unlawful kind, the offence becomes felony.—BIBLIOGRAPHY: *Encyclopœdia of the Laws of England*; Sir J. F. Stephen, *History of the Criminal Law*.

CON'STABLE (Fr. *connétable*; O.Fr. *conestable*; Lat. *comes stabuli*, count of the stable). An officer of high rank in several of the mediæval monarchies. Among the Franks, after the *major domus*, or mayor of the palace, had become king, the *comes stabuli* became the first dignitary of the Crown, commander-in-chief of the armies, and highest judge in military affairs. The *connétable*, however, acquired so much power that Louis XIII. in 1627 abolished the office entirely. Napoleon re-established it, but it vanished with his downfall. In England the office of *Lord High Constable* was created by William the Conqueror, and became hereditary in two different families, as annexed to the earldom of Hereford. Since the attainder of Stafford, however, in 1521, Lord High Constables have been appointed only to officiate on special occasions. The office of Lord High Constable of Scotland, expressly reserved in the Treaty of Union, is hereditary in the noble family of Hay (Earls of Erroll).

In the common modern acceptation of the term constables are police officers in towns, counties, etc., having as their duties the repression of felonies, the keeping of the peace, and the execution of legal warrants. In case of special disturbance a certain number of private citizens may be sworn in as *special constables*. The appointment of special constables is regulated, for the most part, by an Act of 1831.—Cf. W. L. Melville Lee, *History of Police in England*.

CON'STABLE, Archibald. Scottish bookseller and publisher, born in 1774. He was the original publisher of *The Edinburgh Review*, the poems of Sir Walter Scott, the *Waverley Novels*, the *Supplement to the Encyclopœdia Britannica*, and other valuable works. In 1825 he projected the well-known series of works, *Constable's Miscellany*. In 1826, however, the firm was compelled to stop payment, with liabilities exceeding £250,000. Sir Walter Scott, who was heavily involved (for £120,000), practically sacrificed his life in the endeavour to meet his creditors, and Constable himself died in 1827.

CONSTABLE, Henry. Elizabethan poet, born in 1562, educated at Cambridge. He early became a Roman Catholic, and endeavoured to secure the removal of the disabilities of English Catholics. He was imprisoned in the Tower for a time in 1604, on his return from a long sojourn abroad. He died at Liège in 1613. His chief work was his book of sonnets, *Diana*, published in 1592, when few sonnets in the Italian form had been written. His pastoral in *England's Helicon* (1600), entitled *The Shepherd's Song of Venus and Adonis*, is said to have suggested Shakespeare's *Venus and Adonis*. *The Catholic Moderator*, a work of devotion, has also been attributed to Constable.

CONSTABLE, John. English landscape painter, born in Suffolk in 1776. He was employed in the business of his father, a wealthy miller, for some years, but entered as a student of the Royal Academy in 1799. It was not till 1814, twelve years after he had begun to exhibit pictures, that he succeeded in getting any of them sold. He obtained greater appreciation in France, and exercised a powerful influence on the development of French painting. In 1819 he became A.R.A., and R.A. in 1829. He died in 1837. Among his principal pictures are: *The Valley Farm*, *The Hay Wain*, and *The Cornfield*, all in the National Gallery; and *Salisbury Cathedral*, in the Victoria and Albert Museum. Many of his works have been finely engraved by David Lucas.—Cf. C. R. Leslie, *Memoirs of the Life of John Constable, R.A.*

CON'STANCE (Ger. *Konstanz*). A town of Germany, in the former Grand Duchy of Baden, on the south bank of the Lake of Constance, at the outflow of the Rhine into the Lower Lake or Untersee, its chief edifices being a magnificent cathedral, several churches, the Kaufhaus (merchant-house), an ancient palace, a former grand-ducal residence, several convents, and a theatre. The town has various branches of industry and a considerable trade. It was once a flourishing imperial city with three times its present population. Pop. 31,252.

CONSTANCE, Council of. A general council of the Church of Rome, held between 1414 and 1418. The German Emperor, the Pope, 33 cardinals, 3 patriarchs, 47 archbishops, 145 bishops, 124 abbots, 750 doctors, and about 18,000 priests and monks, besides many princes and counts, were present at this assembly, which condemned to death Huss and Jerome

of Prague, expelled the rival Popes John XXIII., Gregory XII., and Benedict XIII., and elected Martin V. (Otto Colonna) to the Papal chair.

CONSTANCE, Lake of, or **BODENSEE** (ancient **Lacus Brigantinus**). A lake, Central Europe, in which Switzerland, Baden, Würtemberg, Bavaria, and Austria (Vorarlberg) meet, forming a reservoir in the course of the Rhine; length, N.W. to S.E., 46 miles; greatest breadth, about 8½ miles; area, 207 sq. miles; greatest depth (between Friedrichshafen and Constance), 827 feet; 1300 feet above sea-level. At its north-west extremity the lake divides into two branches or arms, each about 14 miles in length; the north called the Uberlingersee, after the town of Überlingen; the south the Zellersee or Untersee, in which is the fertile Island of Reichenau, belonging to Baden, about 3 miles long and 1½ miles broad. The lake, which is of a dark-green hue, is subject to sudden risings, the causes of which are unknown. It freezes in severe winters only. The traffic on it is considerable. The shores are fertile but not remarkably picturesque.

CONSTANT. A term in mathematics, the opposite of variable, a quantity which does not change in value. Physical constants are numbers which mark some natural property, either universal or belonging to a special substance.

CONSTANT DE REBECQUE (kŏn-stăn-d-rē-bek), **Henri Benjamin.** Born at Lausanne 1767; prominent French liberal politician. During the Revolution he distinguished himself by his works upon politics and on revolutionary subjects, and was elected to the office of tribune; but his speeches and writings rendered him odious to the First Consul, and he was dismissed in 1802. Similarity of sentiments connected him with Madame de Staël; and with her he travelled through several countries till Napoleon permitted him to return to Paris for a limited period. He then went to Göttingen, and again appeared at Paris in 1814, showing himself zealous in the cause of the Bourbons, though he suffered himself to be appointed counsellor of state by Napoleon. Subsequently he was elected a member of the Chamber of Deputies. He died at Paris in 1830. His numerous writings include: *Cours de politique constitutionnelle* (1817), *Mélanges de littérature et de politique* (1829), and *Adolphe* (1816); besides his more elaborate philosophical work, *De la Religion considérée dans sa Source, ses Formes, et ses Développements* (1824).

CONSTAN'TIA. A small district in Cape Province, a few miles from Cape Town, celebrated for its wine, made from vines brought originally from Persia and the Rhine, esteemed the best liqueur wine after Tokay, and owing its special properties largely to the soil.

CON'STANTINE, Gaius Flavius Valerius Aurelius Claudius. Roman emperor, surnamed the *Great*, son of the Emperor Constantius Chlorus, was born at Naissus, now Nisch, in Serbia, A.D. 274 or 275. When Constantine's father was associated

Constantine. From the statue at Rome

in the government by Diocletian, the son was retained at court as a hostage, but after Diocletian and Maximian had laid down the reins of government, Constantine fled to Britain, to his father, to escape from Galerius. After the death of his father he was chosen emperor by the soldiery, in the year 306, and took possession of the countries which had been subject to his father, namely, Gaul, Spain, and Britain. He more than once defeated the Franks who had obtained a footing in Gaul and drove them across the Rhine; and then directed his arms against Maxentius, who had joined Maximian against him. In the campaign in Italy he

saw, it is said, the vision of a flaming cross in the heavens, beneath the sun, bearing the inscription "*En toutō nika*" or "*In hoc signo vinces*" ("by this conquer"). Under the standard of the cross, therefore, he vanquished the army of Maxentius under the walls of Rome, and entered the city in triumph.

In 313, together with his son-in-law, the eastern emperor, Licinius, he published the memorable Edict of Toleration in favour of the Christians, and subsequently declared Christianity the religion of the State. Licinius, becoming jealous of his fame, twice took up arms against him, but was on each occasion defeated, and finally put to death. Thus in 325 Constantine became the sole head of the Roman Empire. His internal administration was marked by a wise spirit of reform, and by many humane concessions with regard to slaves, accused persons, widows, etc. In 329 he laid the foundation of a new capital of the empire, at Byzantium, which was called after him Constantinople, and soon rivalled Rome herself.

In 332 he fought successfully against the Goths, relieved the empire of a disgraceful tribute which his predecessors had paid to these barbarians, and secured his frontier upon the Danube. In 337 he was taken ill near Nicomedia, was baptized, and died after a reign of thirty-one years, dividing his empire between his three sons, Constantine, Constantius, and Constans. He summoned the celebrated Council of Nicæa in 325 to settle the Arian controversy. He is sometimes regarded as a saint, with the 20th or 21st of May as his festival.—BIBLIOGRAPHY: E. Gibbon, *Decline and Fall of the Roman Empire* (edited by J. B. Bury, 1910); C. H. Firth, *Constantine the Great*; C. B. Coleman, *Constantine the Great and Christianity*.

CON'STANTINE. A town in Algeria, capital of a province of same name, on a rocky peninsula, 2100 feet above the sea, comprising a French and an Arab quarter. It is surrounded by walls, and the only edifice deserving notice is the palace of the bey, now the residence of the French Governor. Roman remains abound, the town having been built by the emperor whose name it bears, on the site of Cirta, the capital of the Numidian kings. The manufactures consist chiefly of woollens, leather goods, and carpets. Its port is Philippeville, connected with it by rail. Pop. 104,902.

CONSTANTINE I. King of Greece, born at Athens 1868, died 1923, the son of King George and Olga, a niece of Tsar Nicholas I. In 1889 he married Princess Sophia, sister of the ex-Kaiser Wilhelm II. of Germany. He was commander-in-chief in the war with Turkey, and the Greek defeat in 1897 made him so unpopular that he had to leave the country. Brought back in 1910, he regained popular favour during the Balkan War. On the assassination of his father on 18th March, 1913, he ascended the throne. As a brother-in-law of the ex-Kaiser, he proclaimed Greece neutral on the outbreak of the European War. His pro-German policy led to quarrels with Venizelos, and resulted in his deposition on 11th June, 1917. Constantine retired to Switzerland, and was succeeded by his second son, Alexander, who died on 25th Oct., 1920. The result of a plebiscite having been in favour of Constantine, he again became King of Greece in Dec., 1920, but abdicated in Sept., 1922.

CONSTANTINE PAVLOVITSH. Grand-Duke of Russia, second son of Paul I., born in 1779. He distinguished himself in 1799 under Suwarrov, and at Austerlitz in 1805; and in 1812, 1813, and 1814 attended his brother, the Emperor Alexander, in all his campaigns. He was afterwards employed in superintending the affairs of the new Kingdom of Poland, and was successively made military governor and generalissimo of the Polish troops. On the decease of his brother in 1825 he was proclaimed emperor at St. Petersburg (Leningrad), in his absence, but as he adhered to a previous renunciation of his claim to the throne, his younger brother, Nicholas, became Alexander's successor. He died in 1831, execrated by the Poles as one of their most barbarous oppressors.

CONSTANTINO'PLE ("city of Constantine", called by the Turks **Stamboul**, from the Gr. *eis tēn polin*, into the city), now known as **Istanbulo.** A city of Turkey in Europe, formerly capital of the Turkish Empire, situated on a promontory jutting into the Sea of Marmora, having the Golden Horn, an inlet of the latter, on the north and the Bosporus on the east. The city proper is thus surrounded by water on all sides excepting the west, where is an ancient and lofty double wall of 4 miles in length, stretching across the promontory. On the opposite side of the Golden Horn are Galata, Pera, and other suburbs, while on the Asiatic side of the Bosporus entrance is Scutari. Occupying the extreme point of the promontory on which the city stands

is the Seraglio or palace of the sultan, which, with its buildings, pavilions, gardens, and groves, includes a large space. At the principal entrance is a large and lofty gate, called Bab Humayum, "the high door" or "sublime porte," from which has been derived the well-known diplomatic phrase.

Of the 379 mosques, the most remarkable are the royal mosques, esteemed the finest in the world. First among these is the mosque of St. Sophia, the most ancient existing Christian church, converted into a mosque in 1453 on the capture of the city by the Turks. Another magnificent mosque is that of Soliman; after which are those of the Sultana Valide, built by the mother of Mohammed IV., and of Sultan Akhmet, the most conspicuous object in the city when viewed from the Sea of Marmora.

The streets are mostly extremely narrow, dark, and dirty, but since the middle of the nineteenth century there have been many improvements, and the city has yielded more and more to Western influences and is losing its Oriental character. A University, nominally founded at Constantinople in 1900, was reorganized by a Bill introduced in the Turkish Chamber in Jan., 1918. The numerous covered and uncovered bazaars are severally allotted to particular trades and merchandise. Constantinople has but one remarkable square, called the At-Meidan, occupying the site of the ancient *Hippodrome*. There are about 130 public baths in the city, mostly of marble, of plain exterior, but handsome and commodious within. The numerous cemeteries, mostly outside the western wall, have become vast forests, extending for miles round the city and its suburbs.

The few manufactures are chiefly confined to articles in morocco leather, saddlery, tobacco-pipes, arms, perfumes, and fine gold and silver embroideries. The foreign commerce is considerable. The Harbour, the Golden Horn, which more resembles a large river than a harbour, is deep, well-sheltered, and capable of containing 1200 large ships, which may load and unload alongside the quays. It is about 6 miles long, and a little more than half a mile broad at the widest part. Among the imports are corn, timber, cotton stuffs, and other manufactured goods. The exports consist of silk, carpets, hides, wool, goats'-hair, and Ionia.

The suburb *Galata* is the principal seat of foreign commerce. Here are situated the arsenals, the dockyard, and the artillery barracks, extending along the Bosporus for nearly 1½ miles. It is an ancient place.—*Pera* occupies the more elevated portion of the promontory of which Galata forms the maritime part. Both it and Galata have now much of the appearance of a modern European town.—*Top-Haneh* is situate a little farther up the Bosporus than Galata, of which it forms a continuation. Yildiz Kiosk, on a hill, was the sultan's residence.

Constantinople occupies the site of the ancient Byzantium, and was named after Constantine the Great, who rebuilt it about A.D. 330. It was taken in 1204 by the Crusaders, who retained it till 1261; and by the Turks under Mohammed II., 29th May, 1453—an event which completed the extinction of the Byzantine Empire. Constantinople was declared an open city on 14th March, 1915, and on 16th March, 1920, the city was occupied by Allied troops under General Milne. By the Treaties of Sèvres (1920) and Lausanne (1923) Turkey retained Constantinople, but Ankara (Angora) is now capital of the country and the seat of the government. Pop. 690,857.

—BIBLIOGRAPHY: Van Millingen, *Byzantine Constantinople*; E. Gibbon, *The Decline and Fall of the Roman Empire*; H. G. Dwight, *Constantinople, Old and New*.

CONSTANTINOPLE, General Councils of. These include the second, fifth, sixth, the Trullan, and the eighth. The second was convoked by Theodosius the Great, in 381, to put down the enemies of the Nicene Creed, who had already been restrained by his decrees. The fifth general council was held by the Emperor Justinian in 553, to decide the dispute of the Three Chapters, or three doctrines of the Bishops Theodore of Mopsuestia, Theodoret, and Ibas of Edessa, who were suspected of Nestorianism, and declared heretics by the council. The sixth council, held 680-681, condemned the doctrines of the Monothelites, and declared their leaders heretics. As these two councils made no new ecclesiastical laws, the Emperor Justinian II., in 692, again summoned a general council, which, because it was held in the Trullan Palace, was called the *Trullan Council*. It instituted rigid laws for the clergy, among them those fixing the rank of the patriarchs and the permission of marriage to priests, which were so offensive to the Latin Church that she rejected all the decrees of this council; but in the Greek Church they are still valid. The eighth

general council (869-870) declared against the Iconoclasts, deposed Photius, and confirmed St. Ignatius in the see of Constantinople.

CONSTAN'TSA. *See* KÜSTENDJI.

CONSTELLA'TIONS. The groups into which astronomers have divided the fixed stars, and which have received names for convenience of description and reference. It is evident that the union of several stars into a constellation, to which the name of some animal, person, or inanimate object is given, must be entirely arbitrary, since the several points (the stars) may be united in a hundred different ways, just as imagination directs. The grouping adopted by the Egyptians was accordingly modified by the Greeks, though they retained the Ram, the Bull, the Dog, and others, and the Greek constellations were again modified by the Romans, and again by the Arabs. At various times, also, endeavours were made to supplant the ancient groupings, the Venerable Bede having given the names of the twelve apostles to the signs of the zodiac, and Judas Schillerius having, in 1627, applied Scripture names to all the constellations. Weigelius, a professor of Jena, even grouped the stars upon a heraldic basis, introducing the arms of all the princes of Europe among the constellations. The old constellations have, however, been for the most part retained.

Ptolemy enumerated forty-eight constellations, which are still called the *Ptolemœan*. They are the following:—1. The twelve signs of the zodiac (*see* ZODIAC). 2. Twenty-one constellations found in the northern hemisphere—the Great Bear (*Ursa Major*), the Little Bear (*Ursa Minor*), Perseus, the Dragon (*Draco*), Cepheus, Cassiopeia, Andromeda, Pegasus, the Little Horse (*Equuleus*), the Triangle (*Triangulum*), the Waggoner (*Auriga*), Boötes, the Northern Crown (*Corona Boreālis*), Ophiuchus, the Serpent (*Serpens*), Hercules, the Arrow (*Sagitta*), the Lyre (*Lyra*), the Swan (*Cygnus*), the Dolphin (*Delphinus*), the Eagle (*Aquila*). 3. Fifteen constellations in the southern hemisphere—Orion, the Whale (*Cetus*), Eridanus, the Hare (*Lepus*), the Great Dog (*Canis Major*), the Little Dog (*Canis Minor*), Hydra, the Cup (*Crater*), the Crow (*Corvus*), the Centaur (*Centaurus*), the Wolf (*Lupus*), the Altar (*Ara*), the Southern Fish (*Piscis Austrālis*), the Argo, the Southern Crown (*Corōna Austrālis*). Others were subsequently added; this being especially rendered necessary by the increased navigation of the southern hemisphere, and additional groups have been marked out associated with all sorts of animals and objects, including the Camelopard, the Fly, the Air-pump, and the Compasses.

The different stars of a constellation are known by the letters of the Greek alphabet, α denoting generally the brightest star, β the next, and so on. The order is not, however, always rigorously observed. Most bright stars have also particular names, generally of Arabic origin.—Cf. E. W. Maunder, *Stars and how to Identify Them*.

CONSTIPATION. The retention of fæces associated with a sluggish action of the bowels. The chief causes are sedentary habits, constitutional peculiarities, certain diseases, e.g. anæmia, affections of the stomach, liver, and intestines, also injudicious drug-taking, weakness of the abdominal muscles, atony of the bowels, dropping of the intestine at certain points (visceroptosis).

The outstanding symptoms are debility and lassitude, with mental depression and loss of appetite, headache, furred tongue, and a "muddy" appearance of the skin. When the condition becomes chronic, it leads to chronic pancreatitis, rheumatism, and the formation of gall-stones, and increases the tendency to piles, appendicitis, and various diseases. The chief points to be observed in treatment are regular habits, exercise, abdominal massage, light diet, with abundance of fruit, vegetables, and oatmeal. Large quantities of water, hot and cold, should be taken, and, when necessary, the milder laxatives may be used. Strong purgatives should be avoided.

CONSTIT'UENT ASSEMBLY. A name given to the first convention of the delegates of the French nation (1789-91) to distinguish it from the legislative assembly of 1791. It drew up and obtained the acceptance of the first of the famous revolutionary constitutions. The Constituent Assembly of 1848 had a similar aim.

CONSTITU'TION. The fundamental law of a State, whether it be a written instrument of a certain date, as that of the United States of America, or an aggregate of laws and usages which have been formed in the course of ages, like the British constitution. The ideal constitution is that established by a free sovereign people for their own regulation, though the expediency of other forms at various stages of national development cannot but be recognized. The chief of these are:—1. Constitutions granted by the plenary power of absolute monarchs, or *con-*

stitutions octroyées; such as Louis XVIII.'s *Charte*. 2. Those formed by contract between a ruler and his people, the contract being mutually binding—a class under which, in a great degree, the British constitution must be placed. 3. Those formed by a compact between different sovereign powers, such as the constitutions of the former German Empire, of the United Provinces of Holland, and of the Swiss Confederation.

In regard to political principles, constitutions are: —1. Democratic, when the fundamental law guarantees to every citizen equal rights, protection, and participation, direct or indirect, in the government, such as the constitutions of the United States and of some cantons of Switzerland. 2. Aristocratic, when the constitution recognizes privileged classes, as the nobility and clergy, and entrusts the government entirely to them, or allows them a very disproportionate share in it. Such a constitution was that of Venice, and such at one time those of some Swiss cantons, for instance, Bern. 3. Of a mixed character. To this division belong some monarchical constitutions, which recognize the existence of a king whose power is modified by other branches of government of a more or less popular cast. The British constitution belongs to this division. The impetus to constitutional government in modern times has come from England, which has been rightly called "the mother of parliaments." *See* articles on various countries.—BIBLIOGRAPHY: W. F. Dodd, *Modern Constitutions*; Sir William Anson, *Law and Custom of the Constitution*; W. Stubbs, *Constitutional History of England*; W. Bagehot, *The English Constitution*; A. V. Dicey, *The Law of the Constitution*; G. B. Adams, *Origin of the English Constitution*; C. E. Stevens, *Sources of the Constitution of the United States*.

CONSTITUTION. In the Roman Church, a decree of the Pope in matters of doctrine. In France, however, this name has been applied, by the way of eminence, to the famous bull *Unigenitus*.

CONSTITUTIONS, Apostolic. *See* APOSTOLIC.

CONSTITUTIONS OF CLARENDON. *See* CLARENDON, CONSTITUTIONS OF.

CONSUBSTAN'TIAL (Lat. *consubstantiālis*). An equivalent for the Greek term *homoousios*, the true significance of which disturbed the religious world early in the fourth century, as it was supposed to affect the orthodoxy of Christians regarding the Trinity, according as it might be understood rightly or the contrary. The Athanasians, or Trinitarians, at the Council of Nice in 325, gave it the meaning indicated in the Nicene Creed, "*Of one substance* with the Father" (applied to Christ).

CONSUBSTANTIA'TION (otherwise **IMPANATION**). The mystical union of the body of Christ with the sacramental elements, according to the Lutherans and others, who maintain that, after the consecration of the elements, the body and blood of Christ are substantially present with the substance of the bread and wine.

CONSUETU'DINARY LAW. In contradistinction to statutory or written law, is that law which is derived by immemorial custom from remote antiquity. *See* COMMON LAW.

CON'SUL. A name originally given to the two highest magistrates in the Republic of Rome. After King Tarquinius Superbus had been expelled by the joint efforts of the patricians and plebeians (509 B.C.), two consuls (*consŭles*) were placed at the head of the Senate, the body in whose hands was the administration of the republic. These officers were annually elected, at first only from the patricians; at a later period (366 B.C.) also from the plebeians. In order to be eligible to the consulship, the candidate was to be forty-five years of age, and must have passed through the inferior offices of quæstor, ædile, and prætor, and he was required by law to be in Rome at the time of the election. All these laws, however, were disregarded at various junctures in Roman history.

Insignia.—The insignia of the consuls were a staff of ivory with an eagle at its head, a toga bordered with purple (*toga prætexta*), which under the emperors was embroidered; an ornamental chair (*sella curŭlis*), and twelve *lictors*, who, with rods and axes (*fasces*), preceded them.

Powers.—In the beginning of the republic the authority of the consuls was almost as great as that of the preceding kings. They could declare war, conclude peace, make alliances, and even order a citizen to be put to death; but their powers were gradually curtailed, especially by the establishment of the tribunes of the people, early in the fifth century. But they still stood at the head of the whole republic: all officers were under them, the tribunes of the people only excepted; they convoked the Senate, proposed what they thought fit, and executed the laws. In times of emergency they received unlimited power, and could

even sentence to death without trial, levy troops, and make war without the resolve of the people first obtained. Under the emperors the consular dignity sank to a shadow, and became merely honorary. The last consul at Rome was Theodorus Paulinus (A.D. 536).

In France the name of *consul* was temporarily adopted for the chief magistrates after the Revolution. The Directorial Government (third constitution) having been abolished by the revolution of the 18th Brumaire, of the year VIII. (9th Nov., 1799), a Provisional Consular Government, consisting of Bonaparte, Siéyès, and Roger Ducos, established the fourth constitution, proclaimed 15th Dec., by which France was declared a republic under a government of *consuls*. Three elective consuls (Bonaparte, Cambacérès, and Lebrun) had almost uncontrolled executive authority, while the legislative power was in the hands of the tribunate and the legislative assembly; a conservative Senate was also elected. But as early as 2nd Aug., 1802, Bonaparte was proclaimed First Consul for life, and thus the constitution of France became again practically monarchical On 10th April, 1804, he was proclaimed emperor, and even the nominal consulate ended.

Duties.—At present *consuls* are officials appointed by the Government of one country to attend to its commercial interests in seaports or other towns of another country. The duties of a consul, generally speaking, are to promote the trade of the country he represents; to give advice and assistance to his fellow-subjects when called upon; to uphold their lawful interests and privileges if any attempt be made to injure them; to transmit reports of trade to his own Government; to authenticate certain documents; etc.

Until the year 1825 British consuls were usually merchants residing in foreign countries, but an Act of that year organized the consular service as a branch of the civil service. They are generally of three ranks: *consuls-general*, *consuls*, and *vice-consuls*. The rank of agent and consul-general entitles the bearer to precedence immediately after major-generals and rear-admirals; that of consul-general after colonels, commandant, and commodores; consuls rank after colonels and captains of the Royal Navy of three years' standing, and before all other captains; vice-consuls after majors and lieutenants in the Royal Navy of eight years' standing. *See* DIPLOMATIC SERVICE.

CONSULATE OF THE SEA. *See* CONSOLATO DEL MARE.

CONSUMPTION, PHTHISIS, or PULMONARY TUBERCULOSIS. A disease of the lungs resulting from infection by the tubercle bacillus. It is a disease widespread throughout the British Isles, and its prevention and treatment constitute one of the most pressing problems of medicine to-day.

Three types of the disease are recognized: (1) acute phthisis, (2) chronic ulcerative phthisis, (3) fibroid phthisis.

Acute Phthisis.—The first type, known also as galloping consumption, is found in children and adults, but is most commonly seen in adolescence. It usually begins suddenly, and runs a course somewhat similar to pneumonia. It continues longer, however, than that disease, and for weeks there is high fever with great wasting. It may end fatally in five or six weeks, or drag on for several months, and in the latter case it frequently becomes chronic in type.

Chronic Ulcerative Phthisis.—The second group includes the great majority of cases of phthisis, and the lesions in the lung substance lead to ulceration and softening, developing into the typical chronic phthisis. The onset *is* gradual, and may present extraordinary diversity, often making diagnosis very difficult. There may be symptoms of dyspepsia and anæmia, and this gastric mode of onset is specially common in young girls, associated with anæmia, giving rise to palpitation, debility, slight afternoon fever, and amenorrhœa, while a number of cases begin by repeated attacks of chill with fever and sweating, recurring with such regularity as to give rise to confusion with malaria. Frequently the typical symptoms follow an attack of pleurisy, and in certain cases the disease may be preceded by huskiness of the voice and laryngeal symptoms. The first sign may be a brisk hæmorrhage from the lungs (hæmoptysis), following which the pulmonary symptoms often come on with great rapidity. Lastly, and in the majority of cases, the onset is with a bronchitis. This frequently shows itself in the liability to catch "cold." A history of frequent recurring "colds" in a person throughout a winter is a sign to be viewed with suspicion.

The outstanding symptoms are pain in the chest; cough, frequent from the beginning to the end; sputum, usually increasing as the disease progresses; hæmoptysis, which may occur any time throughout the disease; fever, usually rising to a maximum in the afternoon; sweat

ing, most common at night; emaciation, shown by progressive and gradual loss of weight.

Fibroid Phthisis.—The third group—fibroid phthisis—arises when the tuberculous process in the lung, instead of leading to ulceration, becomes surrounded by a dense fibrous growth—a hardening of the part. The disease is checked, and this fibroid condition may be present for years—the patient finally dying from some other cause altogether.

Precautions.—Every public body now, as well as medical opinion, recognizes the importance of attempting the prevention of phthisis. The chief measures are: (1) education of the public; (2) notification of the disease; (3) improved housing conditions; (4) laws regarding spitting and disinfection and cleaning of infected rooms, inspection of dairies and abattoirs; (5) organization of sanatoria and hospitals for early cases, and establishment of separate dispensaries with a system of visiting the patients at their homes; (6) care of the sputum of the consumptive, as practically the only risk of infection to others is from this source.

A delicate child, or an infant of tuberculous parents, should be brought up with special care and guarded against catarrhal infections. Mouth-breathing or any evidence of naso-pharyngeal obstruction should be watched for, and enlarged tonsils or adenoid growths removed. The child should live in the open air as much as possible, with a regular diet of plain substantial food and abundance of milk, while as the child grows older breathing exercises should be undertaken regularly, and preference given to an out-of-door life when choosing an occupation.

Sanatorium treatment for early cases, properly carried out and lasting a sufficient period of time, undoubtedly leads to many good results, but since the establishment of the Insurance Act in Great Britain in 1911, with the attempt to control the treatment of phthisis among all workers, it has become clear that the necessary accommodation in sanatoria is quite inadequate, resulting in much delay in beginning the treatment and in insufficient time being allowed for its being carried out. Local health authorities are at present trying to deal with the problem by a combination of sanatorium and dispensary treatment for the patients who come under their care.

Tuberculin (introduced by Koch, who first recognized the tubercle bacillus) has been widely used in various forms both for diagnosis and treatment of tuberculous infections, but the results, as far as treatment is concerned, have been on the whole disappointing, and it is now less widely used. Many drugs have been used at different times, but none has proved specific, and they are now recognized as only being of value in allaying one or other of the symptoms of the disease.

CONSUMPTION. Generally treated by modern writers on economics (unlike the older school) as a separate department of economics, distinct from and preceding production and distribution. This emphasizes the conception of economics as dealing with all man's activities in relation to wealth rather than with purely commercial and industrial problems.

The study of consumption is concerned with (1) wants in relation to the means of satisfying them, and to each other; (2) the reaction of the satisfaction of wants upon production. The basic conception in this study is that of utility in the widest sense, "the power or capacity [of goods and services] to satisfy desire or serve a purpose" (Mill); for, according to the utility of goods and services to him, the consumer regulates and distributes his consumption. An important distinction is between total and marginal (or final) utility. After a point, the utility obtained from the consumption of successive portions of a commodity diminishes. Thus the total utility of a loaf of bread may be great, but the utility of the last slice eaten, i.e. the marginal utility, may be small. From the consumer's point of view the ideal is for the marginal utility of every article to be zero, as this implies complete abundance of everything. As it is, the consumer has to distribute his resources in different directions, so that there would be no increase in utility by consuming more of one thing and less of another. This point is reached when the marginal utility of the articles consumed is equal.

Consumption is sometimes characterized as productive or unproductive, according as it does or does not directly conduce to the efficiency of a producer and to further production. Thus, the wealth expended on art, fine clothing, higher education, may be regarded as unproductively consumed. The classification is unsatisfactory, however, the distribution lying mainly in the degree or directness with which the act of consumption is related to production. Thus, the moral and recreative benefit of art to the community may

indirectly increase efficiency in production. Similarly, expenditure on war and armaments may be productive consumption, by ensuring security and the stability of commercial conditions. Consumption being the end and object of all production, in general the demand of the consumer determines how the various agents of production (land, labour, capital) are employed.

Production may, however, considerably influence consumption owing to (1) the production of a new article creating a new want; (2) scarcity or abundance leading to changes in the quantity or method of consumption. During the Middle Ages, Government regulation of consumption by sumptuary and other laws was widespread, but fell into disuse. During the European War it was extensively readopted, and its practicability under modern conditions demonstrated, also its possibilities as a method of social reorganization. *See* ECONOMICS; FREE TRADE; WEALTH.—Cf. Wicksteed, *Alphabet of Economic Science.*

CONTACT ACTION. *See* CATALYSIS.

CONTAGION, or INFECTION. The process of transfer of specific diseases. As most diseases are now recognized to be due to germs, contagion very largely means the transference of germs from an infected person to another person. The germs may be spread by the air or by direct contact, and by the excretions, clothing, or bedding of a patient, and the degree of contagion varies according to the initial virulence of the germ, to the length of time it can remain alive outside the infected person, its ability to live in moisture, and other such factors. The distinction that was at one time made between contagion and infection is now quite needless.

CONTAGIOUS DISEASES (ANIMALS) ACTS. British Acts of Parliament passed in order to prevent the spread of contagious diseases among cattle, sheep, and pigs. The first was passed in 1869, as a consequence of the ravages of the disease known as *Rinderpest* or cattle-plague, which broke out in 1865. This and other Acts were consolidated by a general Act of 1894. The provisions of the Act are to be carried out under the supervision of the Board of Agriculture, the orders of the Board being enforced by local authorities. Owners of diseased animals (the diseases include anthrax, cattle-plague, pleuro-pneumonia, foot-and-mouth disease, and swine fever) must at once isolate them, and notify the police, who notify the Board.

On the report of an inspector, the Board or local authority may declare a place, with all lands and buildings contiguous, to be an affected place. They may also declare a still wider extent of the surrounding district an infected *area.* The Board is also empowered to make arrangements respecting transit of infected cattle, and may order the slaughter of all animals affected with disease, and all animals that have been in the same stable or shed with infected animals, and even all animals suspected of disease, and all animals within the area declared infected. Provision is made for compensation to owners of slaughtered animals. The mode of ascertaining compensation is laid down in the Animals Amendment Order of 1904. Power is also given to the Board to issue orders prohibiting the landing of animals, fodder, etc., from a foreign country; and to appoint ports at which alone foreign animals may be landed. Penalties are imposed for offences against the Acts.

CONTAN'GO. In stock-jobbing, a sum of money paid to a seller for accommodating a buyer, by carrying the engagement to pay the price of shares bought over to the next account day. In reality contango is interest paid for the loan of money for fourteen days, that is, for the interval between account days. *See* BACKWARDATION.

CONTARI'NI. A noble family of Venice which furnished (between 1043 and 1684) eight doges to the State, besides several men of note. Mario Contarini was one of the twelve electors of the first doge of Venice in 697.

CONTEMPT'. An offence against the dignity, order, or authority of a court or legislative assembly. Contempts committed out of court may be punished by fine or imprisonment; contempts done before court are usually punished in a summary way by commitment or fine. The power of vindicating their authority against contempt is incident to all superior courts.

CONTENT and **NONCONTENT** are the words by which assent and dissent are expressed in the House of Lords. *Aye* and *No* are used in the House of Commons.

CON'TINENT. A connected tract of land of great extent, forming a sort of whole by itself, as Europe, Asia, Africa, North and South America; or we may speak of the Eastern and Western continents, Europe, Asia, and Africa being regarded as one, and North and South

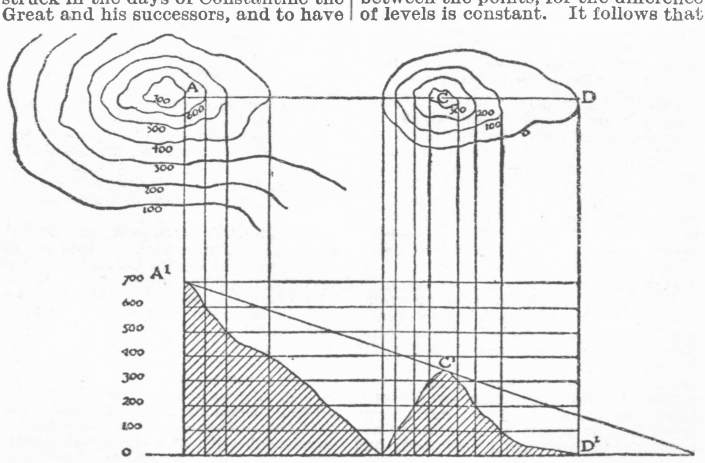
America another. Australia, from its size, may also be regarded as a continent.

CONTINEN'TAL BLOCKADE, or CONTINENTAL SYSTEM. A plan devised by Napoleon to exclude Britain from all intercourse with the continent of Europe. It began with the Decree of Berlin of 21st Nov., 1806, by which the British Islands were declared to be in a state of blockade; all commerce, intercourse, and correspondence were prohibited; every Briton found in France, or a country occupied by French troops, was declared a prisoner of war; all property belonging to Britons, fair prize; and all trade in goods from Britain or British colonies entirely prohibited. Britain replied by Orders in Council prohibiting trade with French ports, and declaring all harbours of France and her allies subjected to the same restrictions as if they were closely blockaded. Further decrees on the part of France, of a still more stringent kind, declared all vessels of whatever flag, which had been searched by a British vessel or paid duty to Britain, denationalized, and directing the burning of all British goods, etc. These decrees caused great annoyance, and gave rise to much smuggling, till annulled at the fall of Napoleon, 1814.

CONTORNIA'TI (It.). Ancient medals or medallions in bronze, having a curved furrow (*contorno*) on each side, supposed to have been struck in the days of Constantine the Great and his successors, and to have formed tickets of admission to the public games of the circus of Rome and of Constantinople.

CONTOUR, or CONTOUR-LINE. In physical geography, a line drawn on a map through all the points which are at a given height above sea-level. If we imagine sections of the country to be made by horizontal planes at stated equal distances from one another of, say, 50 feet, then the contour-lines are the bounding curves of these sections. In a map these curves, with their levels marked on them, are shown projected on a horizontal plane, but they are not altered in shape or size by the projection. Near a mountain peak the contours are small ovals, gradually contracting to a point directly beneath the summit.

The contours on a map give an engineer or military commander valuable information. With practice he learns to read at once from the map what he wants to know about the lie of a district. For example, suppose that two adjacent points are taken one on each of the 100 and 150 feet contours; and suppose that by means of the scale of the map it is found that the horizontal distance between the points is 1000 feet. Then the average gradient or steepness of the direct road between the two points is 50 in 1000, or 1 in 20. Again, the gradient between two points on two given contours is inversely proportional to the distance between the points, for the difference of levels is constant. It follows that



Contour lines

A C D, Contours. A^1 C^1 D^1, Ground contoured.

the gradients near any particular point on the map are indicated by the degree of closeness with which the contours are packed together there. It also follows that the lines of greatest slope, which are the lines followed by running water, are everywhere perpendicular to the contour-lines; for any small length AB on a line of greatest slope must be the shortest distance from A to the contour-line through B, and must, therefore, be perpendicular to that contour-line.

The method of contours gives us what is really a two-dimensional graph of a function of two independent variables. In the geographical case the independent variables may be considered to be the latitude and longitude, and the function graphed is the altitude. Other examples of the use of the method are: isothermal and adiabatic lines in thermodynamic diagrams, isobars and isothermals in meteorology, isogonal and isoclinal lines in terrestrial magnetism.

CONTRABAND OF WAR. Various commodities which neutral nations are forbidden by international law to supply to belligerents. There are two kinds of contraband: material prepared for direct military use, and material which, though not of this category, can be adapted for military use. The question of contraband was discussed at the second Hague Conference (1907), and the Conference of London, 1908-9, specified certain articles as definitely contraband or non-contraband. The definition and application of the term contraband have always been the subject of much controversy.

CONTRABAS'SO. The Italian name, now usually employed by musicians of all nationalities to designate the largest instrument of the violin kind (called sometimes the *double bass*), with three strings usually tuned in fourths. Its compass is from the lower A of the bass clef to tenor F. In Germany a fourth string is used, which gives it a range of three notes lower.

CONTRACT. In law, an agreement or covenant between two or more persons, in which each party binds himself to do or forbear from doing some act, and each acquires a right to what the other promises. A contract thus consists of an agreement and an obligation to perform that agreement. The agreement must be the result of an offer in set terms, revocable until accepted, but once so accepted irrevocable except by consent of the acceptor. *See* CONSENT. No obligation arises if the agreement is for a purpose illegal or contrary to public policy or is one which the law declares to be void. Thus, an agreement to do injury to another, or a contract not to marry at all, or a bet, is void. Secondly, at common law the agreement must either be under seal or founded on some consideration, i.e. there must be some "right, interest, profit, or benefit accruing to one party, or some forbearance, detriment, loss, or responsibility given, suffered, or undertaken by the other."

Provided there is consideration the contract may be written, verbal, or implied from the conduct of the parties. Thirdly, by statute, some contracts must be under seal or in writing, signed by the party to be charged or his authorized agent, in order to give rise to damages for non-performance; thus, by the Law of Property Act, 1925, leases of land in England for more than three years must be under seal, and contracts for the sale of land so situate must be in writing. Lastly, contracts by corporations for matters other than those "of trifling importance, of everyday necessary occurrence" must be under seal; but limited companies can make valid contracts in the same form as private persons.

In Scotland leases of land for more than one year must be under seal, and contracts for the sale of land so situate must be in writing. The law of contract is very similar in England and Scotland, but the law as to promises differs. In England a promise or undertaking without consideration is not binding unless made in a deed under seal. In Scotland such a promise is binding, but it can be proved only by writing or an admission on oath of the party who made it.—BIBLIOGRAPHY: S. M. Leake, *Principles of the Law of Contract*; Sir F. Pollock, *Principles of Contract*; J. C. Miles and J. L. Brierly, *Cases illustrating the Law of Contract*; Anson, *Law of Contract*.

CONTRACT, Original or Social. In politics, that which is supposed to exist from the beginning between the sovereign power and the subject. The theory is as old as the Greeks, but in modern times it has been elaborated chiefly by Hobbes in his *Leviathan* (1651) and other works. Such a contract is a mere supposition, having no historical foundation in any annals which have been preserved. Spencer, however, maintains that the doctrine of social contract is consistent with the theory of evolution, and that the opposite political doctrines, such as force, are inconsistent with it. The *Contrat Social*,

ou principes du droit politique, is the title of a work written by J. J. Rousseau and published in 1741.

CONTRACTIL'ITY. In biology, the power possessed by living matter (protoplasm) of altering its shape without diminution of volume. It may result in creeping movements (Amœba and colourless blood corpuscles); ciliary action (*see* CILIA); or muscular contraction, in which there is shortening associated with a corresponding broadening. The last may be *involuntary* (as in heart and other internal organs), or *voluntary* (as in the muscles of locomotion).

CONTRAC'TIONS. Abbreviations employed with a view to saving labour in writing, and also in former times with a view to saving parchment in extending MS. copies of works, deeds, etc. Contraction takes place in several ways, as by elision; writing a smaller letter above the word contracted; running two or more letters into one character; by symbols representing syllables or words; by initial letters; thus: *recd.* for *received*; *qᵃm* for *quam*; *Mr.* for *Master*; *&* for *et*; *p* for *per*; *S.P.Q.R.* for *Senatus populusque Romanus*. When the contraction consists of the initial letter, syllable, or syllables of a word, as *ult.* for *ultimo*, it is more correctly termed an *abbreviation*. *See* ABBREVIATIONS.

CONTRACT NOTE. A note given by a stockbroker to a client informing him of a transaction or transactions carried out on his behalf, and stating the amount of his commission. The British stamp duties on Contract Notes are on a graduated scale, and are from 6*d.* for stock or security valued at £5 and not exceeding £100, 1*s.* above £100 to £500, and so on to a maximum of £1 for over £20,000.

CONTRAL'TO. In music, the highest voice of a male adult, or the lowest of a woman or a boy, called also the *Alto*, or when possessed by a man *Counter-tenor*. It is next below the treble and above the tenor, its easy range being from tenor G to treble C.

CONTRAYER'VA. The aromatic bitterish root of *Dorstenia Contrayerva*, a plant of the nettle family, imported from tropical America, and used as a stimulant and tonic.

CONTREXÉVILLE (kōn-trek-sā-vēl). A French watering-place in the Vosges, six hours from Paris, in a ravine on the River Vair, with springs highly beneficial in cases of gout or calculus; baths, hotels, casino, etc. Much water is sent away in bottle. Pop. 850.

CONTROL'LER. A public officer appointed to control, oversee, or verify the accounts of other officers. The Controller of the Navy is the Third Sea Lord. The term is also applied to a contrivance on shipboard for holding the anchor chain and keeping it from running out while weighing anchor.

CON'TUMACY. In law, disobedience of the orders of a court; the offence of non-appearance when summoned judicially.

CO'NUS. A genus of gasteropodous molluscs, the type of the family Conidæ or cone-shells, so named from the conical form of the shell. They are found in the southern and tropical seas. The shells are among those most highly valued by collectors, the record price being £43, 1*s.* for a specimen of *Conus gloria maris*.

CONVALLA'RIA. A genus of plants, nat. ord. Liliaceæ, the only species being the lily-of-the-valley.

CONVENER. One who convenes or calls a meeting. In Scotland the term is used for chairmen of county councils and presidents of committees.

CON'VENT, *See* MONASTERY.

CONVEN'TICLE. A private assembly or meeting for the exercise of religion. Historically, the term was specially applied to meetings of petty sects and dissenters in the statutes of the time of Charles II. The Conventicle Act of 1664 rendered illegal any gathering in a private house for religious worship, attended by a number exceeding by five the regular numbers of the household. The repressive Acts were abrogated after the revolution of 1688 and the accession of William of Orange.

CONVENTION (Lat. *conventio*, a meeting). A formal or statutory assembly, particularly of delegates or representatives, for discussing civil or political matters. In Great Britain the name *Convention Parliament* is given to the assembling of Parliament without the king's writ; as in 1660, when Charles II. was restored, and in 1688, when the throne was left vacant by the flight of James II. The meetings of the political parties that choose the candidate for the U.S. presidency are called conventions. In 1932 both the Republicans and the Democrats held their conventions in Chicago. —**Convention of Royal Burghs,** a yearly meeting held in Edinburgh by commissioners from all the burghs of Scotland to discuss industrial regulations, etc.—**National Convention,** in French history, the name given to that body which met

after the Legislative Assembly had pronounced the suspension of the royal functions (Sept., 1792), and proclaimed the republic at its first sitting.

Agreements between states on matters of non-political interest are usually called conventions, such as those concerning fisheries between Great Britain and the U.S.A. Conventions negotiated at international conferences regulate postal services, telegraphs, sugar bounties, copyright, patents, trade marks, the slave trade, the succour of wounded in war, and international courts.

CONVERGENCY. Resemblance between unrelated organisms adapted to a similar mode of life. Some limbless Amphibia (Cæcilians) resemble earth-worms, and, like them, burrow in the soil. Certain limbless lizards such as the so-called "blind worm," are often mistaken for snakes, being adapted in similar fashion to wriggling through dense vegetation. Many plants living in arid regions, and belonging to several distinct orders, have developed protective spines (reduced leaves), and possess succulent swollen stems adapted to water storage, and covered with tough investments by which evaporation is checked.

CONVERGENCY OF SERIES. Series are said to be convergent when the sum of a large number of terms can be made to differ less and less from a certain fixed limit by increasing the number of terms.

CONVERSA'NO. A town in South Italy, province of Bari, 18 miles S.E. of Bari, with a fine cathedral, and a trade in wine, oil, almonds, flax, and cotton. Pop. 13,950.

CONVERSION. In logic, one of three chief methods of immediate inference. A proposition is *converted* when the predicate is put in the place of the subject, and the subject in place of the predicate; as, "no A is B" ("no virtuous man is a rebel"), the converse of which is "no B is A" ("no rebel is a virtuous man"). Simple conversion, however, in this manner is not always logical. In the case of universal affirmatives, for example, "all A are B" (say, "all men are animals"), the simple converse "all B are A" ("all animals are men") would not be true.

In Theology.—*Conversion* is the acceptation of Christianity by heathens. It also denotes a change from one religion to another, or a change of attitude towards God.

In Law.—*Conversion* is an unauthorized exercise of the right of ownership over personal property belonging to another in opposition to his rights.

CON'VEX (Lat. *convexus*, vaulted, arched). Rising in a circular or rounded form; the contrary to *concave*. Thus the inside of a watch-glass is concave, the outer surface convex.

CON'VEY'ANCING. The practice of drawing deeds, leases, or other writings (*conveyances*) for transferring property, or an interest therein, from one person to another, of investigating the title of the vendors and purchasers of property, and of framing those multifarious deeds and contracts which govern and define the rights and liabilities of families and individuals. The business of conveyancing is carried on by barristers, solicitors, and members of the legal profession generally.—Cf. Sir H. W. Elphinstone, *Introduction to Conveyancing*.

CON'VICT. In Britain the general term for a person who has been found guilty of a serious offence and sentenced to penal servitude, such servitude consisting usually in forced labour on some public work, as in the construction of a harbour, fortification, breakwater, or the like. Transportation was formerly the equivalent punishment.

CONVIC'TION. The finding a person guilty of an offence by the verdict of a jury. In certain cases of minor offences, such as are tried before justices of the peace, etc., the law allows of convictions without the intervention of a jury (summary jurisdiction).

CONVOCA'TION. An assembly of the clergy or of the graduates of certain universities. In England the name is specifically given to an assembly of the clergy belonging either to the province of Canterbury or to that of York, to consult on ecclesiastical matters. From the fact that the province of Canterbury is by much the more influential of the two provinces into which England is ecclesiastically divided the convocation of the province of Canterbury is often spoken of as *the* convocation, as if there were only one. In former times they had the power of enacting canons; but this power was virtually abolished under Henry VIII. and Elizabeth. The action of convocation as a deliberative body began in 1861.

CONVOLVULA'CEÆ. A nat. ord. of gamopetalous dicotyledons, comprising about 700 species largely consisting of climbers. Some of them have valuable properties. Jalap is

derived from the *Ipomœa purga*, an inhabitant of Mexico.

CONVOL'VULUS. A genus of plants, type of the nat. ord. Convolvulaceæ, consisting of slender twining herbs with milky juice, bell-shaped flowers, and five free stamens. Some British species are commonly known as bindweeds; others are

Convolvulus

cultivated in gardens. *C. tricolor* or minor convolvulus, with its large flowers of violet blue, with white and yellow centre, is a familiar species. Scammony is obtained from the root of the *Convolvulus Scammonia*, a native of Syria; the liqueur *noyau* from *C. dissectus*, which contains prussic acid.

CON'VOY. A fleet of merchantmen under the protection of a ship or ships of war, or the ship or ships appointed to conduct and defend them from attack and capture by an enemy. In military language it is used for *escort*. The rules as to convoys have been laid down by the London Convention on the Laws and Customs of Naval War (1908-9). During the European War millions of troops and about fifty million tons of stores were convoyed by the British navy.

CONVULSION. An involuntary contraction usually violent in nature, the result of muscular spasm, and popularly known as a *fit*. Children of a nervous or unstable type frequently suffer from convulsions as the result of teething, intestinal upset, worms, etc., or at the onset of some serious illness, e.g. pneumonia. Convulsions may be, on the other hand, the direct sign of brain disease, seen in brain tumour, fractured skull, and epilepsy, or may arise in the course of other diseases, as in puerperal fever, or in the uræmic convulsions of renal disease. Convulsions may be general, causing complete loss of consciousness, or partial, with only local manifestations of the disturbance, as in the convulsions of tetanus.

CONVUL'SIONISTS, or CONVULSIONARIES. Those fanatics of the eighteenth century in France who had or affected to have convulsions, produced by religious impulses. The name was first applied to fanatics who exhibited varied seizures at the tomb of a Jansenist at St. Médard, some jumping, some barking, and others mewing like a cat. A number of them were imprisoned in 1733, but this had little effect. *See* JANSENISTS.

CONWAY, Moncure Daniel. American writer, born in Virginia in 1832; became a Methodist preacher and then a Unitarian preacher (advocated emancipation though his father owned slaves), and, coming to England, was long the minister of a religious body of advanced views in London. He died in 1907. His writings include works on Carlyle, Emerson, and Hawthorne; *Demonology and Devil Lore*; *The Wandering Jew*; *The Life of Thomas Paine*, and an edition of his works; and an *Autobiography*.

CONWAY, William Martin Conway, first Baron. Writer on art and traveller, born in 1856, graduated at Cambridge; was professor of art at University College, Liverpool, and Slade professor of fine arts at Cambridge (1901-4). Director-General of the National War Museum, 1917; member of Parliament for the combined English universities since 1918. He is especially noted as a mountain-climber, having made extensive explorations in Spitzbergen, the Himalayas, and the Andes, making ascents of Sorata, Illimani, Aconcagua, etc. He is author of *Woodcutters of the Netherlands in the Fifteenth Century*; *Early Flemish Artists*; *Dawn of Art in the Ancient World*; *Early Tuscan Artists*; *The Alps from End to End*; *First Crossing of Spitzbergen*; *The Bolivian Andes*; *Aconcagua and Tierra del Fuego*; *The Alps*; *No Man's Land: a History of Spitzbergen*; *The Sport of Collecting*; *The Crowd in Peace and War*; and *The*

Abbey of St. Denis. He received a peerage in 1931.

CONWAY, or **ABERCONWAY.** A town and municipal borough of North Wales, in Carnarvonshire, about 15 miles E.N.E. of Bangor, at the mouth of the Conway. It is notable for its old castle built by Edward I., a suspension bridge built by Telford, and a tubular railway bridge by Stephenson. Pop. (1931), 8769.—The River Conway has a course of about 30 miles.

COOCH-BEHAR', or **KUCH-BEHAR'.** A native state in India, in political relation with the government of Bengal. It forms a level plain of triangular shape, intersected by numerous rivers, and is entirely surrounded by British territory. The greater portion of the soil is fertile and well-cultivated. Area, 1313 sq. miles; pop. 592,952. The chief town, **Cooch-Behar,** contains some handsome public buildings and a splendid new palace of the Maharajah. Pop. 11,400.

COOK, Eliza. English poetess, born in London in 1818, died in 1889. She contributed to the *Weekly Dispatch*, *Metropolitan Magazine*, and *New Monthly Magazine*. Her first volume of verse, *Lays of a Wild Harp*, appeared in 1835. She afterwards wrote a great many poems, nearly all lyrical, and some of her songs have been highly popular. From 1849 to 1854 she carried on a weekly periodical, *Eliza Cook's Journal*. She had a pension of £100 from the Civil List.

COOK, James. A famous British navigator, born in Yorkshire 1728. His father was an agricultural labourer and afterwards a farm bailiff. He was at first apprenticed to a shopkeeper; but acquiring a love for the sea, he became a sailor. In 1755 he entered the Royal Navy, and four years later, as sailing-master of the *Mercury*, performed valuable services in surveying the St. Lawrence River and the coast of Newfoundland. Observations on a solar eclipse, communicated to the Royal Society, brought him into notice, and in 1768 he was put in command of a scientific expedition to the Pacific, with the rank of lieutenant. In the *Endeavour* he visited Tahiti (for the transit of Venus), New Zealand, discovered New South Wales, and returned by the Cape of Good Hope to Britain in 1771.

In 1772 Captain Cook, now raised to the rank of a commander in the navy, commanded a second expedition to the Pacific and Southern Oceans, which resulted, like the former, in many interesting observations and discoveries. He returned to Britain in 1774. Two years later he again set out on an expedition to ascertain the possibility of a north-west passage. On this voyage he explored the western coast of North America, and discovered the Sandwich Islands, on one of which, Hawaii, he was killed by the natives, 14th Feb., 1779.

Captain Cook wrote and published a complete account of his second voyage of discovery, and an unfinished one of the third voyage,

Captain James Cook

afterwards completed and published by Captain James King (*Hawkesworth's Voyages*, 1773, vols. ii. and iii.).—BIBLIOGRAPHY: A. Kippis, *Narrative of the Voyages round the World performed by Captain James Cook*; A. Kitson, *Captain James Cook, the Circumnavigator.*

COOK, Thomas. Founder of the great tourist agency of Thomas Cook & Son, was born in 1808, and died in 1892. He began operations with short tourist trips from Leicester, where he resided, gradually increasing the length and number of his excursions; then removed to London (1865), his only son, John Mason Cook, being now his partner, and the business extended with great rapidity. In 1872 he started on a tour round the world, to pave the way for tourist

business, and in 1878 resigned the management to his son, under whose direction the operations of the firm may be said to have extended to the whole world. The latter was consulted by the British Government in connection with the Gordon relief expedition in 1884, and was entrusted with the conveyance of 18,000 British and Egyptian troops and an immense quantity of stores, etc., from Assiout to Wady Halfa. He died in 1899, leaving several sons to carry on the business, which now includes banking and shipping departments. Owing to the excellent organization of the firm, a trip round the world is now an easy matter.

COOKERY. The preparation of food so as to render it more palatable and more digestible. The art is of great importance, not only for comfort but also for health. Food is mainly prepared by submitting it to the action of fire, as by roasting, boiling, stewing, etc. These processes give each a different flavour to food, but result alike in rendering the tissues, both of animal and vegetable food, softer and much more easily dealt with by the digestive organs.

The art of cookery was carried to considerable perfection amongst some of the ancient nations, as, for instance, the Egyptians, Persians, and Athenians. Extravagance and luxury at table were notable features of Roman life under the empire.

Amongst moderns the Italians were the first to reach a high degree of art in this department. Their cooking, like that of the ancient Romans, is distinguished by a free use of oil. Italian cookery seems to have been transplanted by the princesses of the House of Medici to France, and was carried there to perhaps the highest degree of perfection; for French cooks can produce dainty dishes from very ordinary materials. British cookery has been mostly confined to ordinary, plain, and substantial dishes. The art of roasting is perhaps its strong point.

Since the last quarter of the nineteenth century attempts have been made in London and other places to diffuse a knowledge of cookery more widely among the lower classes. In particular the National School of Cookery, headquarters at South Kensington, has sent forth lecturers and teachers to almost all the chief towns of Great Britain with the result of establishing local centres in many places. — BIBLIOGRAPHY: Brillat-Savarin, *Physiologie du goût*; W. C. Hazlitt, *Old Cookery Books and Ancient Cuisine*; E. R. Pennell, *My Cookery Books*; G. Vicaire, *Bibliographie gastronomique*; C. H. Senn, *The New Century Cookery Book*; Cassell's *New Dictionary of Cookery*; Filippini, *International Cook-Book*; *The Cookery Annual*. J. R. Ainsworth-Davis, *Cooking through the Centuries*.

COOK ISLANDS. A group of islands in the Pacific Ocean, so called because discovered by Captain Cook. *See* HERVEY ISLANDS.

COOK'S INLET. An inlet of the North Pacific Ocean, running into the territory of Alaska for about 150 miles; explored by Captain Cook in 1778.

COOKSTOWN. A town, Ireland, in the east of County Tyrone; with manufactures of linen and bleach-works. Pop. (1926), 3554.

COOK STRAIT. The channel which separates the two principal islands of New Zealand, discovered by Captain Cook in 1770.

COOKTOWN. A seaport in the north of Queensland, on the Endeavour River, one of the chief ports of the colony, in a district where are gold- and tin-mines, and where the sugar-cane, tobacco, etc., are cultivated. Captain Cook beached his ship here in 1770. Pop. 1257.

COOLGAR'DIE. A gold-mining town in the interior of Western Australia, which has risen up since the gold discoveries of 1891, and has now churches, schools, banks, hotels, stock exchange, and theatres. It may be reached by railway both from Fremantle and Albany. The natural water-supply is bad, but abundance of good water is now brought from a reservoir about 20 miles from Perth, over a distance of 328 miles (being forced through iron pipes), the scheme, which was boldly conceived and executed, costing £2,800,000. Pop. 2533; of district, 15,000.

COOLIDGE, John Calvin. Thirtieth President of the U.S.A. He was born at Plymouth, Vermont, 4th July, 1872. He studied law and was admitted to the Bar in 1897, and after various legal and political appointments, became Governor of Massachusetts in 1919, when he dealt firmly with the Boston Police Strikers. In 1921 he was made Vice-President of the U.S.A. and in 1923 President. He was re-elected for 1925–29. During his term of office, portions of the national debt were paid off, income tax was reduced, and the country was very prosperous.

COOLIE (Tamil, *kuli*). A name in Hindustan for a day labourer, also extended to those of some other Eastern countries. Many of these have been introduced into the West

Indies, Mauritius, and other places, their passage being paid for them on their agreeing to serve for a term of years. The first coolie emigrants appear to have been those sent to British Guiana from Calcutta in 1839 to supply the want of labour felt after the abolition of slavery. The coolies employed in Guiana are still chiefly from India, but there is also a considerable number of Chinese. Coolies have also been introduced into Jamaica, Trinidad, Natal, and large numbers into Mauritius, the Indian population of this island being over 260,000. Many thousand Chinese labourers have been introduced to work in the gold-mines of the Transvaal. Coolie labour is also employed in Cuba, Peru, and Tahiti. In some countries, such as Australia and America, Chinese or Indian immigrants are not made welcome, even though they pay their own passage. Thousands of Chinese coolies were employed in France during the European War.—BIBLIOGRAPHY: E. Jenkins, *The Coolie: his Rights and Wrongs*; J. L. A. Hope, *In Quest of Coolies*.

COOLING TOWERS. Structures used for cooling the circulating water used for condensing purposes in power plants which are situated away from natural sources of cold water. They are usually made of wood, and are of rectangular cross-section. Sometimes they are made of steel, and are circular in cross-section. The towers are 60 feet to 70 feet high, and about 30 feet by 40 feet in cross-section. The interior is packed with wooden hurdles, laths, and distributing trays for spreading the water. The bottom of the tower is open to the atmosphere, and below it a large tank is constructed. The circulating water is pumped to a height of about 30 feet, where it enters the cooling-tower. It is then carefully distributed all over the packing in the tower. The vapours rising from the hot water create a powerful draught of cold air from the bottom upwards through the tower. This cold air meets the descending spray of hot water and cools it, and the water falls as a kind of cold rain into the pond beneath, from which it is pumped to the condensers and again heated by them. The cycle is a continuous one.

The factors which particularly affect the cooling action of the tower are (*a*) the temperature of the air; (*b*) the humidity of the air; (*c*) the temperature of the hot water; (*d*) the size and height of the tower; (*e*) the degree of uniformity in the distribution of the descending water. For purposes of calculation, it is usually assumed that the air passes up the tower at a velocity of about 300 feet per second, and that it leaves the tower at the temperature of the hot water and fully saturated with moisture. In this way the amount of air required to cool a given amount of water through a given difference of temperature can be arrived at, and from this information the area of the tower required follows. In passing through the tower the cooling air picks up moisture, and consequently there is a continuous removal of circulating water. This loss of circulating water, which must be made up for continuously, does not usually exceed more than about 1 per cent.—BIBLIOGRAPHY: E. Housbrand, *Condensers, Evaporators, and Cooling Plant*; Magnus Maclean, *Modern Electrical Engineering*.

COOL-TANKARD. An old English beverage of varied composition, but usually made of ale, with a little wine, lemon juice, spices, and borage, or other savoury herbs.

COOM'ASSIE, now **KU'MASI.** A town, West Africa, capital of Ashanti, 130 miles N. of Cape Coast Castle, now connected with the coast by railway. It was taken by the British in 1874, and again in 1900 after severe fighting. Pop. 25,000.

COOMBE, or **COMBE, William.** Born in 1741, died in 1823, author of several popular works, including *The Diaboliad: The Devil upon Two Sticks in England*, a continuation and imitation of Le Sage's novel, but far inferior in spirit and graphic delineation to the original; *The Tour of Dr. Syntax in Search of the Picturesque*; *The History of Johnny Quœ Genus*; and the *English Dance of Death*; all accompanied by Rowlandson's prints, to which they owed most of their value.

COO'MIE. A present in place of customs duty, demanded by the kings and chiefs at parts of the West African coast for permission to trade with the natives.

COOMPTAH. A town of India, on the sea-coast, in the Presidency of Bombay, about 330 miles S.S.E. of Bombay. It has an open roadstead and a large cotton trade. Pop. 10,629.

COOPER, Sir Astley Paston. English surgeon, was born in Norfolk, 1768, died in 1841. He studied medicine in London, and attended the lectures of John Hunter. After visiting Paris in 1794, he was appointed professor of anatomy at Surgeons' Hall, and in 1800 head surgeon of Guy's Hospital. In 1822 appeared his great work on *Disloca-*

tions and Fractures. Shortly after he became president of the Royal College of Surgeons, and honours and titles of every kind poured in on him. His other works include: *The Principles and Practice of Surgery*, and *Anatomy of the Breast*.

COOPER, James Fenimore. American novelist, born at Burlington, New Jersey, in 1789, studied at Yale College, and entered the American navy as a midshipman at the age of nineteen. In 1820 he published his first novel, *Precaution*. Though successful it gave no scope for his peculiar powers, and it was not till the production of *The Spy* (1821) and *The Pioneers* that he began to take a high place amongst contemporary novelists. After that came a steady flow of novels dealing with life on the sea and in the backwoods, most of which, like *The Pilot*, *Red Rover*, *Waterwitch*, *Pathfinder*, *Deer-slayer*, and *Last of the Mohicans*, are familiar names to the novel-reading public. After visiting Europe and serving as Consul for the United States at Lyons for three years, Cooper returned to America, where he died at Cooperstown, New York, 1851. Besides his novels, he wrote a *History of the Navy of the United States*, and some volumes descriptive of his travels.—BIBLIOGRAPHY: J. Erskine, *Leading American Novelists*; M. E. Phillips, *James Fenimore Cooper*.

COOPER, Peter. American inventor, manufacturer, and philanthropist, born 1791, died 1883. He started life with few advantages, being almost self-educated; but by dint of energy, perseverance, sagacity, and integrity, accumulated a large fortune. He carried on the manufacture of glue and isinglass for over fifty years, and was also connected with the iron-manufacture, the railways (he designed and built the first American locomotive), and the telegraphs of the United States. The "Cooper Union" in New York was established by him to furnish a free education in art and practical science. It comprises day classes, in which women are instructed in drawing, painting, and other branches of art; evening classes, in which young men and women are taught art, engineering, chemistry, mathematics, and other subjects; and a free reading-room and library.

COOPER, Thomas. Chartist poet and miscellaneous writer, born 1805, died 1892. While a shoemaker's apprentice he studied assiduously, became a schoolmaster and Methodist preacher, then adopted sceptical opinions, but afterwards lectured in favour of Christianity. His prominence as a Chartist earned him imprisonment, and his chief work, a poem in the Spenserian stanza, called the *Purgatory of Suicides*, was written in Stafford Jail. He also wrote novels and an autobiography.

COOPER, Thomas Sidney. Landscape and cattle painter, born 1803, died 1902. He studied at the Royal Academy school and on the Continent; first exhibited at the Academy in 1833, became A.R.A. in 1845, and R.A. in 1867. He produced a long series of works, such as *River Scene*, *Cow and Two Sheep* (both in the National Gallery), and many others. In 1882 he presented a gallery of art to his native town, Canterbury, and in 1890 published his autobiography.

CO-OPERATIVE SOCIETIES. Associations of individuals for mutual assistance in industrial or commercial objects. One form of association is that which concerns itself with production of various kinds; but more common is that which aims at providing the members, and sometimes also the general public, with ordinary household necessaries, at as near as possible wholesale prices, by means of what are commonly known as **Co-operative Stores**. Co-operative societies of the latter kind have been established very widely in Great Britain and on the Continent, but are comparatively unimportant in the United States. One of the first and most successful of them is the Rochdale Equitable Pioneers' Society, founded in 1844. This, and others, are conducted on the principle of dividing the surplus profits among the members alone in proportion to their purchases, after a certain fixed percentage has been deducted for interest on the capital. It provides its customers with butcher-meat, groceries, boots and shoes, drapery, etc.; a part of the profits is devoted to educational purposes; and direct facilities for investment by members are provided. Most of the stores sell goods to non-members, who may also receive a dividend in proportion to the amount of their purchases.

In connection with these societies are two great wholesale societies, one in England and another in Scotland, established for the purpose of making their purchases on as large a scale as possible. These associations also produce or manufacture various kinds of goods for the retail trade. Similar associations have been formed for the benefit of other than the working-classes, such as clergymen, lawyers, officers in the army and navy, and

members of the civil service, the most extensive of these being in London; but they are not truly co-operative in that the consumers or members as such have no share in the profits.

Manufacturing associations of various kinds, as well as stores, have been established both in Britain and on the European continent, and have been tolerably successful. In Britain they have recently increased in number, and embrace societies engaged in making flour, boots and shoes, clothing, hardware, and articles in metal and wood, printing, etc. In these societies the shareholders are usually also the workmen, and the surplus profits are divided among them as workmen after they have received the fixed percentage as shareholders, and in some cases also among the workmen who are not shareholders, if there are any such. In some cases the shareholders, though working-men, do not work in their own establishments, but employ others, like ordinary capitalists.

Co-operation in agriculture has recently made rapid advances, especially in Denmark and Germany. These societies differ from manufacturing associations in that they provide members with materials to be used by them as individuals, and dispose of produce individually raised. The establishment of co-operative banks or loan societies has been of great service, especially in agriculture. These societies borrow on the guarantee of all the members, and make advances to members at slightly higher rates, generally much below that at which members could borrow for themselves. In 1930 the sales of co-operative societies connected with agriculture and fishing were £24,926,000.

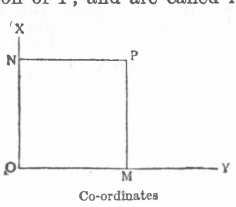
By 1931 the total number of consumers' societies had reached 1371 (including retail, wholesale, and productive associations), with a membership of 6,610,000. Their retail sales amounted to £207,457,000; on this there was a surplus for distribution of £26,432,000. *See also* BUILDING SOCIETIES; FRIENDLY SOCIETIES; TRADE UNIONS. — BIBLIOGRAPHY: C. J. Holyoake, *History of Co-operation*; *The Co-operative Movement of To-day*; C. R. Fay, *Co-operation at Home and Abroad*; Mrs. Sidney Webb (Beatrice Potter), *Co-operative Movement in Great Britain*; Bubnoff, *Co-operative Movement in Russia*; L. S. Woolf, *Co-operation and the Future of Industry*; *International Co-operative Bibliography*; *Co-operative Year Book*.

COOPERING (kō'pêr-ing; from Du. *kooper*, a buyer, a dealer). A term applied to the selling or bartering of strong drink, tobacco, etc., but especially drink, to the fishermen engaged in their business on the North Sea, by boats from Dutch or other foreign ports—a demoralizing trade, which has been almost put down by the efforts of the British Government. In 1887 Great Britain, Germany, Belgium, Denmark, France, and the Netherlands prohibited the sale of spirits on the North Sea. Next year Great Britain embodied the terms of the convention in the North Seas Fisheries Act, 1888, which was replaced by the North Sea Fisheries Act, 1893. There are now English mission ships at work on the North Sea which are allowed to sell tobacco to fishermen at a cheap rate, but all traffic in spirits at sea is strictly forbidden.

COOPER'S CREEK, or the **BARCOO.** Called by the latter name chiefly in its upper course, the largest inland river of Australia, which rises in Queensland by two branches, the Thomson and Victoria (or Barcoo), and flows south-west to Lake Eyre.

COOPER'S HILL. A ridge on the borders of Surrey and Berkshire, which gave its name to a famous poem by Sir John Denham (1643). Cooper's Hill College, established in 1870 for engineering and other students to be engaged in the public service of India, was closed in 1906.

CO-ORDINATES. In geometry, a term applied to magnitudes which fix the position of a point in a plane or space. If, from a point P, lines PM and PN be drawn parallel to two fixed intersecting lines OX and OY, the lengths PM and PN fix the position of P, and are called its ob-



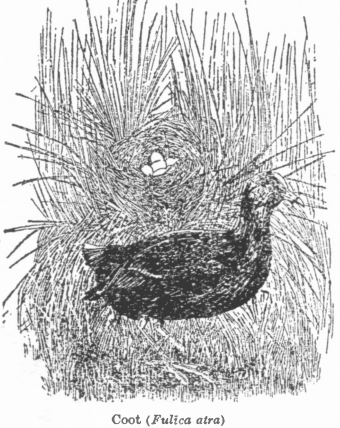
Co-ordinates

lique co-ordinates with reference to the axes; rectangular if OX and OY are at right angles. In space a point is fixed by three co-ordinates which measure its distance from three mutually rectangular planes. A point P in a plane can also be fixed by its distance from a fixed point O and the angle OP makes with a fixed line through O. These are polar co-ordinates. In higher geometry there are other systems, areal, trilinear,

homogeneous, etc. The method of co-ordinates for dealing with geometrical problems was invented by Descartes.

COORG, or **KURG.** A province of India, lying between Mysore on the east and north-east and the districts of South Canara and Malabar on the west; area, 1582 sq. miles. The country has a healthy climate, and yields coffee, spices, and timber. The capital is Merkara. Pop. 163,089.

COOT. An aquatic bird of the rail family (Rallidæ), frequenting lakes and ponds. The common coot (*Fulica atra*) has a bald forehead, a black body, and lobated toes, and is about 15 inches in length. The nests, which are very large, strong, and compact, are composed of reeds and rank water-herbage, built sometimes near the water's edge, and sometimes on small islets at some distance from the shore. Should the nest be set adrift by a rise of water, the female coot seems in no-wise disturbed, but sits composedly on her eggs until it is stranded. The coot of India, China, and Japan is



Coot (*Fulica atra*)
The eggs are buff colour with brown spots.

said to be identical with that of Europe, but the North American coot is now recognized as a distinct species, and has received the name of *F. Wilsoni*.

COPAIBA, or **COPAIVA** (ko-pā'ba, ko-pā'va). The name of a balsam and an oil. The balsam is a liquid resinous juice flowing from incisions made in the stem of a plant, *Copaifēra officinālis* (nat. ord. Leguminosæ), and several other species of the genus, growing in Brazil, Peru, etc. It consists of several resins dissolved in a volatile oil. The resins are partly acid and partly neutral; the oil is

Copaiba (*Copaifēra Lansdorfii*)
Fruit. 2, Flower.

clear, colourless, and has an aromatic odour. It is used in medicine, especially in affections of the mucous membranes (as those of the urino-genital organs).

COPAIS (ko-pā'is). A lake or marsh of Greece in Bœotia, enclosed by mountains on every side, and forming a shallow expansion of the River Cephissus some 20 miles broad, the water having numerous subterranean outlets to the sea. In the time of Aristophanes the lake was famous for its eels, which were much relished by Athenian gourmets. In 1831 a French company was formed for draining the lake, thus acquiring for agricultural purposes some 53,000 acres of land. Operations were commenced in 1886, and the works have since been completed, the area being now drained and cultivated.

CO'PAL. A gum-resin yielded by different trees in Africa, South America, India, and Australia, and differing considerably in its qualities according to its origin; but in general

it is hard, shining, transparent, and citron-coloured. When dissolved in alcohol or turpentine it makes a beautiful and very durable varnish. Indian copal, known in England as *gum animé*, is produced by *Vateria Indica*; Madagascar copal from *Hymenœa verrucōsa*; Brazilian copal from several species of Hymenæa and Icica, and from *Trachylobium martianum*. A substance called *fossil copal* or *copalin* is found in some places. It resembles copal resin in colour and odour.

COPALCHE BARK (kō-pal'chā). The bark of the *Strychnos pseudo-quina* (ord. Loganiaceæ), a native of Brazil. The name is also given to the bark of *Croton pseudo-china* (ord. Euphorbiaceæ) of Mexico.

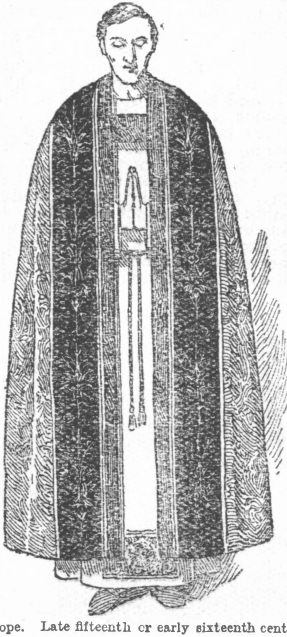
COPAN'. A ruined city of Central America, Honduras, on the Copan River.

COPARCENARY. In law, partnership in inheritance; applied in English law to female heirs who on intestacy inherited real estate jointly. By the Administration of Estates Act, 1925, all forms of heirship were abolished as from 1st Jan., 1926, and new rules of descent were enacted. *See* DESCENT.

COPE. A liturgical vestment, resembling a sleeveless cloak with a hood, reaching from the shoulders to the feet, worn on solemn occasions, and particularly in processions, by the Pope and other bishops as well as by priests. It was one of the vestments retained at the Reformation in the Anglican Church, as it was not one of the "Mass vestments." The Syon Cope in the South Kensington Museum, and the Ascoli Cope are remarkable as representing the highest excellence of English thirteenth-century embroidery.

COPE, Charles West. English painter, born 1811, died in 1890. He studied at the Royal Academy and in Italy, and first exhibited at the Academy in 1831. In 1843 he gained a prize of £300 for his picture *The First Trial by Jury*; in 1844, by his fresco the *Meeting of Jacob and Rachael*, secured the commission for one of six frescoes for the House of Lords, producing, accordingly, *Edward the Black Prince receiving the Order of the Garter*. Altogether he executed eight frescoes from English history for the House of Lords, while his other works were numerous, the subjects being historical, romantic, or domestic. We may mention *Last Days of Cardinal Wolsey*, *Prince Henry before Justice Gascoigne*, and *The Departure of the Pilgrim Fathers*. He became A.R.A. in 1844 and R.A. in 1848, but retired in 1883.

COPE, Sir John. Birth date unknown, died 1760, an English general whose name is known chiefly through a Jacobite ballad (*Hey, Johnnie Cope! are ye waukin' yet?*) on the battle of Prestonpans, in which he was defeated by Prince Charles Edward on the morning of 21st Sept., 1745.



Cope. Late fifteenth or early sixteenth century

CO'PECK (*kopeika*, a lance). A Russian copper coin, so called from the impression of St. George bearing a lance, equal to the hundredth part of a rouble in value. Before the European War it was practically equivalent to a farthing in British currency.

COPENHA'GEN (Dan. *Kjöbenhavn*, "merchants' haven"). The capital of Denmark, on the Sound, the larger and older portion of it on the east side of the Island of Zealand, a smaller portion on the north point of the Island of Amager, with between them a branch of the sea forming the harbour. It has a citadel and several strong forts protecting it on the sea side.

Buildings.—The chief buildings are the royal palace of Christianborg, largely destroyed by fire in 1884; the castle of Rosenborg, with many antiques and precious articles; the Amalienborg, consisting, properly speaking, of four palaces, one of them the usual residence of the sovereign; the palace of Charlottenburg, now the repository of the Academy of Arts; the Royal Library containing 600,000 volumes and 25,000 manuscripts; the new town hall; Thorwaldsen's Museum, containing a great many of the sculptor's works; the university buildings; the Vor Frue Kirke; and the arsenal. The university, founded by Christian I. in 1479, has about 120 professors and teachers, and 4700 students, five faculties, and a library of 300,000 volumes. The harbour is safe and commodious.

Commerce.—Copenhagen is the principal station of the Danish fleet and the centre of the commerce of Denmark. A free port was established about 1890. It carries on an active trade with Norway, Sweden, Russia, and Germany, and in particular with Britain, the principal exports being grain, butter, cheese, beef, pork, cattle, horses, and hides. It has foundries and machine-works, textile-mills, porcelain-works, breweries, distilleries, and sugar-refineries.

History.—Copenhagen is first mentioned as a fishing hamlet in 1043. In 1443 it was made the capital of Denmark. It has occasionally suffered much from fires and from hostile attacks, the most disastrous being the bombardment by the British from the 2nd to the 5th of Sept., 1807. In 1801 the Danish fleet was here defeated by Sir Hyde Parker and Nelson, in the battle known as the Battle of the Baltic. The environs in some parts are very fine. Pop. in 1880, 234,850, or including suburbs, 273,320; in 1930, 617,069, with suburbs, 771,168.—Cf. E. C. Hargrove, *The Charm of Copenhagen*.

COPEP'ODA (Gr. *kopē*, an oar). An order of minute entomostracous fresh-water and marine crustacea, so named because their five pairs of feet are mostly used for swimming. They form an important part of the floating population (plankton) of the sea and lakes, and furnish food to many fishes.

COPER'NICUS, or KOPPERNIGK, Nicolaus. Astronomer, born at Thorn, then in Poland, 19th Feb., 1473, his family being supposed to have come originally from Westphalia. Having studied medicine and theology at Cracow, and law at Bologna, he was made a canon of Frauenburg in 1497. In 1500 he went to Rome, where he taught mathematics and astronomy.

He studied medicine at Padua, and in 1505 finally left Italy for Prussia to carry out the work of his life. Doubting that the motions of the heavenly bodies could be so confused and so complicated as the Ptolemaic system made them, he was induced to consider the simpler hypothesis that the sun was the centre round which the earth and the other planets revolve. Besides this fundamental truth Copernicus anticipated many other of the principal facts of astronomical science, such as the motion of the earth round its axis, and the immense distance of the stars, which made their apparent position the same from any part of the earth's orbit. His general theory also enabled him to explain for the first time many of the important phenomena of nature, such as the variations of the seasons and the precession of the equinoxes.

The great work in which Copernicus explained his theory, *De Orbium cœlestium Revolutionibus* (On the Revolutions of the Celestial Orbs), was completed in 1530, and published at Nürnberg in 1543. A quater-centenary edition was issued at Thorn in 1873. It was long among books forbidden to Roman Catholics, but disappeared from the revised Index of Benedict XIV. in 1758. Copernicus died at Frauenburg, 24th May, 1543. *See* GALILEO.

COPIAPÓ. A river, a town, and a seaport of Chile. The river flows west from the Andes to the Pacific, and has a course of 120 miles. About 30 miles from the sea is the town of Copiapó, capital of Atacama province, the centre of an important mining district. It is connected by rail with its port Caldera. Pop. 10,747. The small seaport Porto Copiapó stands in the mouth of the river.

COP'LEY, John Singleton. A self-taught and distinguished painter, was born in 1737 in Boston, Massachusetts, and died in London in 1815, where he settled in 1776, and acquired a reputation as an historical painter. He was elected a member of the Royal Academy in 1783. His most celebrated picture is *The Death of Chatham*, now in the National Gallery, and popularized by Bartolozzi's engraving. His son, who was Lord High Chancellor, became Lord Lyndhurst.

COPPÉE, François Édouard Joachim. French poet, novelist, and

dramatist, born in Paris 1842, died 1908. His first book of poems, *Le reliquaire*, appeared in 1866, and was followed by *Les intimités* (1868) and *Poèmes modernes* (1869), which marked him as a Parnassian. Soon, however, he abandoned the aristocratic tendencies of the Parnassians, and became the poet of the working-classes and the interpreter of the stern realities of life. He wrote: *Les humbles* (1872), *Le cahier rouge* (1874), *L'arrière-saison* (1890), *Dans la prière et la lutte* (1901). Among his plays are: *Severo Torelli* (1883), *Les Jacobites* (1885), and *Pour la couronne* (1895). His novels include: *Toute une jeunesse* (1890), wherein he told his own story; and *Le coupable* (1897). From 1880 to 1884 Coppée was dramatic critic of the newspaper *La Patrie*, and in 1884 he was elected to the Académie Française.

COP'PER. One of the most anciently known metals, deriving its name from *Cyprus*, large supplies having in Greek and Roman times come from that island. It is a metal of a pale-red colour tinged with yellow; chemical symbol, Cu; atomic weight, 63·6. Next to gold, silver, and platinum it is the most ductile and malleable of metals; it is more elastic than any metal except steel, and the most sonorous of all except aluminium. Its conducting power for heat and electricity is inferior only to that of silver. It has a distinct odour and a nauseous metallic taste. It is not affected by water, but tarnishes on exposure to the air, and becomes covered with a green carbonate.

It occurs native in branched pieces, dendritic, in thin plates, and rarely in regular crystals, in the primitive and older secondary rocks. Blocks of native copper have sometimes been got weighing many tons. Its ores are numerous and abundant. Of these several contain sulphur and iron or other metal, such as copper glance or vitreous copper (Cu_2S); grey copper or Fahlerz, one of the most abundant and important ores; and copper pyrites or yellow copper-ore ($CuFeS_2$), another abundant ore. The red oxide of copper (Cu_2O) forms crystals of a fine red colour, and is used for colouring glass. There are two native carbonates, the blue and the green, the latter being the beautiful mineral *malachite*, the former known as azurite. *Blue vitriol* is a sulphate, and is used for dyeing and preparing pigments, as are various other copper compounds. *Verdigris* is an acetate. The arsenite of copper is the pigment *Scheele's green*. *Schweinfurth green* is another copper pigment. All the compounds of copper are poisonous.

It is found in most European countries, in Australia and Japan, in Africa, and in North and South America (especially in the vicinity of Lake Superior). In Britain the mines of Cornwall now yield little. Copper is extracted from its ores either by the dry or the wet process. For the former the old Welsh process was largely used in the past, and consisted of alternate roasting and smelting operations in reverberatory furnaces, with the result that the sulphur, iron, and impurities were gradually eliminated, and blister copper obtained, which was refined in a refining furnace.

At the present time most of the copper produced is obtained by smelting the ore, first to a matte or regulus, which consists of a mixture of copper sulphide and iron sulphide. For coarse or lump ores this is carried out in a water-jacketed blast-furnace (*see* BLAST-FURNACE). For fine ores and concentrates, large reverberatory furnaces are used. The matte thus produced is poured in the molten state into a converter, similar to the Bessemer converter used for the manufacture of steel, and air is blown through. This oxidizes the sulphur, which escapes as gas, and also oxidizes the iron, and the iron oxide formed combines with the silica of the lining or added silica to form a slag. The metallic copper thus obtained is similar to blister copper, and is refined either in a refining furnace or by an electrolytic process, in which the crude metal serves as an anode and a strip of pure copper as cathode.

In extracting the metal from pyrites by the wet process, the ore is first roasted to get rid of the larger proportion of sulphur, which is used for the manufacture of sulphuric acid, then the calcined residue still containing sulphur is mixed with common salt, ground, and heated in furnaces. The copper is thus converted into chloride, part of which volatilizes, but is condensed by passage through flues and water-condensers. After some hours the calcined mixture is raked out of the furnace, cooled, and transferred to tanks, where it is exhausted by successive treatment with water. The solution, containing chloride of copper, sulphate and chloride of sodium, and iron salts, is next heated along with scrap-iron. Copper precipitates in the form of a ruddy, lustrous, tolerably compact mass, with a crystalline appearance, and mixed with metallic-iron and oxide. The larger pieces of iron are picked out,

the precipitate washed and drained, and then melted and refined.

Many alloys of copper, especially those containing tin and zinc, are of much importance, e.g. *brass*, an alloy of copper and zinc; *bronze*, an alloy of copper and tin. Copper is applied to many useful purposes. It is the conductor universally employed in telegraph, telephone, and electric-power transmission lines. In sheets it is used for constructing boilers and stills of a large size; and pipes of various sorts, as well as wire and lightning-rods, are made of it. It is also used in electrotyping and engraving, for various household utensils and fittings; but its use for household utensils is by no means free from danger on account of the formation of verdigris by the action of acids. The world's production of copper amounts to 1,000,000 tons per annum (1,395,160 in 1918), the United States alone producing over 850,000 tons.—BIBLIOGRAPHY: W. H. Weld, *The Copper Mines of the World*; *Mines and Copper Handbook*; E. D. Peters, *The Practice of Copper Smelting*; H. K. Picard, *Copper, from the Ore to the Metal*.

COPPER AGE. Term used by archæologists for the period in which man used implements made of copper. It is supposed to follow the stone age, and to be followed by the bronze age. Its date was somewhere about 2000 B.C.

COP'PERAS. Sulphate of iron or green vitriol ($FeSO_4 \cdot 7H_2O$), a salt of a peculiar astringent taste and of a fine green colour. When exposed to the air it assumes a brownish hue. It is much used in dyeing black and in making ink, and in medicine as a tonic. The copperas of commerce is usually made by the decomposition of iron pyrites. *See* IRON.

COPPER GLANCE. Native copper sulphide. *See* CHALCOCITE.

COPPER-HEAD, or MOCCASIN SNAKE. A venomous N. American serpent, the *Agkistrodon contortrix* of the rattlesnake family.

COP'PERING. Sheathing a ship's bottom with thin sheets of copper, to prevent the ship-worm eating into the planks, or to keep shells and weeds from accumulating on the surface, and so retarding a vessel in her sailing.

COPPERMINE RIVER. A river, British North America, which falls, after a course of about 250 miles, into the Arctic Ocean, in lat. 68° N.; long. 113° W.

COPPER-NICKEL, or KUPFERNICKEL (false-copper), also known as **keline** and **niccolite**. A hard copper-red ore of nickel, NiAs, found in Saxony and elsewhere. It is interesting as the source from which the metal nickel was first obtained. At first it was thought to be an ore of copper, but A. F. Cronstedt in 1751, and T. Bergmann in 1775, proved that it contained a new metal. At the present time the world's supply of nickel comes almost entirely from the garnierite of New Caledonia and the Canadian nickeliferous pyrrhotines.

COPPER-PLATE. A polished plate of copper on which the lines of some drawing or design are engraved or etched to be printed from; also a print or impression from such a plate.

COPPER PYRI'TES. *See* CHALCOPYRITE.

COP'PICE, or COPSE WOOD. A wood in which the trees are cut over periodically as they attain a certain size. In Britain many forest trees, and in particular the oak, the chestnut, the ash, the birch, and the maple, are dealt with in this way. The period for cutting varies with the soil and the tree. The oak usually requires from fifteen to twenty-five years' growth, while the willow is cut regularly every year. The term is also used in a general sense for a wood of small growth, or consisting of underwood and brushwood.

COP'RA. The dried kernel of the coco-nut, from which the oil has not yet been expressed, a considerable article of commerce in some tropical regions.

COP'ROLITES (Gr. *kopros*, dung, and *lithos*, stone), properly the fossil excrement of reptiles or fishes, or indeed of other organisms. The term has also been applied for trade purposes to phosphatic concretions, such as those in the Red Crag of England. True coprolites are ovoid in form, sometimes with twisted markings, and consist largely of calcium phosphate. The comminuted bones of fishes may sometimes be found embedded in them. Their high percentage of calcium phosphate, amounting sometimes to 65 per cent, renders them serviceable as fertilizers for agricultural use, either in a pulverized form or more commonly as superphosphate. They are very frequently called ground coprolites.

COPTIC LANGUAGE. The Coptic language belongs to the Hamitic group of African languages. It was spoken from the third to the sixteenth century, but is now extinct as a vernacular. Like Egyptian, of which Coptic is a direct descendant, it was at first almost monosyllabic, but gradually developed into a highly agglutinative language. The Coptic

alphabet has 31 letters, 24 of which are Greek uncials. It was gradually displaced by Arabic after the Mohammedan conquest of Egypt, but the language is said to have been spoken as late as 1633. Coptic is still used in a formal way in the religious services of the Copts. There is an abundant Coptic Christian literature, consisting chiefly of homilies and lives of saints.

COP'TIS. A small genus of plants, nat. ord. Ranunculaceæ, two species of which, *C. trifolia* (gold-thread), found in Canada and the northern parts of the United States, and *C. teeta* of Assam, yield a bitter tonic used medicinally.

COPTS. A name given to the Christian descendants, supposed to be the purest representatives, of the Ancient Egyptian race, belonging mostly to the Jacobite or Monophysite sect. Reduced by a long course of oppression and misrule to a state of degradation, the number and national character of the Copts have greatly declined. At present they number about 700,000. Their costume resembles that of the Moslems, but they are very generally in the habit of wearing a black turban for distinction's sake. In various other respects they resemble the Moslem, and they practise circumcision and abhor the flesh of swine. The women go out with veiled faces, like the Moslem women.

There are schools for the male children, but very few of the females are taught to read. Confession is required of all. Fasting holds a prominent place in the life of the Copt, who is, indeed, required to fast (that is, to abstain from all animal food except fish) during the greater part of every year. The head of the Coptic Church is the Patriarch of Alexandria, who is also head of the Abyssinian Church. He is regarded as the successor of St. Mark, by whom the Copts believe that Christianity was introduced among them. They are very strict and exclusive in their religion, but a certain number have been converted to Protestantism. The Copts are quiet and industrious, have a good capacity for business, but are servile and crafty. The Coptic scribes form a close guild.—BIBLIOGRAPHY: A. J. Butler, *Ancient Coptic Churches of Egypt*; J. Milne, *A History of Egypt under Roman Rule*; E. W. Lane, *Modern Egyptians*; article *Coptic Church* in Hastings's *Encyclopædia of Religion and Ethics*.

COPY. A writing, picture, etc., made in direct imitation of another. Of late years photography has been much used in copying paintings, engravings, and maps. Lithography is frequently used in multiplying copies of writings, such as circulars, and such contrivances as the gelatine pad and the papyrograph are also in common use. A copy of a work of art made by the artist himself is called a *replica* or *doublette*, and a reproduction of a piece of sculpture in plaster a *cast*.

COP'YHOLD. In English law, a tenure of land by copy from the court rolls belonging to a manor. Copyhold property cannot be now created, for the foundation on which it rests is, that the property has been possessed time out of mind, by copy of court roll, and that the tenements are within the manor. In 1858 Parliament passed a law which enables either the lord or tenant of any copyhold lands to compel enfranchisement of the land and convert it into freehold, either in consideration of a fixed sum or of an annual rent. Copyhold does not exist in the United States. By the Law of Property Act, 1922, all copyholds were converted as from 1st Jan., 1926, into freeholds. Absolute ownership was thus achieved.

COPYRIGHT. Under the rules of common law copyright existed only in respect of unpublished works. At the moment when publication had been made, whatever the originality, whatever the imagination and the skill expended in the production of any work, the right to multiply that work lay open to the world. The first attempt to remedy this injustice was made by an Act of 1709, but the framework of the modern law is to be found in an Act passed in the year 1842, which, with its amending Acts, regulated copyright until 1st July, 1912, when the existing Statute—The Copyright Act, 1911—came into force. That Act, the Musical Copyright Acts, 1902 and 1906, and Sections 7 and 8 of The Fine Arts Copyright Act, 1862, embody the present law of British, and to a great extent of Imperial, copyright.

Definition.—Copyright is defined as "the sole right to produce or reproduce any" original literary, dramatic, musical, and artistic "work or any substantial part thereof in any material form whatsoever; to perform, or in the case of a lecture, to deliver, the work or any substantial part thereof in public; if the work is unpublished, to publish the work or any substantial part thereof," and includes the rights of translation, dramatization, and conversion into a novel, record, or film. The term "original" is hardly capable of

definition, but does not imply absolute novelty, e.g. there may be copyright in a guide-book or a time-table. "Literary work" includes maps, charts, plans, tables, and compilations; "dramatic work" includes recitations, choreographic work, and plays without words; "artistic work" includes paintings, drawings, sculpture, architecture, and artistic craftsmanship.

Copyright subsists in the United Kingdom and British Dominions adopting the Act of 1911, or coming under its operation by Order in Council, if publication was first made there, or as regards an unpublished work, if the author at the time when the work was executed was either a British subject or resident there. "Publication" means the issue of copies of the work to the public, but not the public performance of a dramatic or musical work, or the public delivery of a lecture, or exhibition of an artistic work. "First publication" is not ruled out by a prior publication occurring within fourteen days thereof outside the area covered by the Act.

In literary, dramatic, and artistic works copyright in the case of a published work subsists during the life of the author and for fifty years thereafter; in the event of joint authorship, during the life of the author who first dies and for fifty years thereafter, or for the life of the survivor, whichever period is the longer; and in the case of a work unpublished, unperformed, or undelivered at the death of the author or surviving joint author, for a term of fifty years after publication, performance, or delivery; in a photograph, for fifty years from the making of the negative; and in mechanical sound-producing instruments, for fifty years from the making of the original plate.

Owners of Copyright.—In general, the author of a work is the first owner of the copyright; but in the case of a painting, engraving, or photograph the first owner is the party who ordered the original and paid for it; and where the work is made in the course of the author's employment, the first owner is the employer, subject always to any agreement to the contrary. The owner may assign his right by written assignation signed by him or by his authorized agent, and that either wholly or partially, and either generally or in respect of a limited area, and for a limited period; but no assignation by an author who is the first owner (other than an assignation by will, and except in the case of a collective work, as a dictionary, encyclopædia, newspaper, etc.) is valid beyond twenty-five years from the death of the author, or beyond twenty-five years from the death of the first deceasing joint author, or after the death of the last surviving joint author, whichever period is the shorter.

Registration is no longer a condition precedent to an action for infringement of copyright. It is infringement to do, without consent of the owner, anything which he has sole right to do in virtue of the Act, e.g. to dramatize a novel, or vice versa, to pirate a work or a substantial part, to make a colourable imitation, or to publish an unpublished work; but it is not infringement to deal fairly with a work for the purposes of private study, research, criticism, review, or newspaper summary; or for an author of an artistic work, not owning the copyright, to use, without imitating the main design, any mould, cast, sketch, etc., made by him for the purpose of the work; or to photograph or copy sculpture or paintings placed permanently in a public building; or to read or recite a reasonable extract in public. Further, on the expiry of twenty-five years (in the case of a work copyright at the passing of the Act thirty years) after the death of the author, and in joint authorship on the expiry of twenty-five (or thirty) years from the death of the first deceasing author, or after the death of the surviving author, whichever period is the shorter, a person may without infringement reproduce a published work for sale after notice in writing of his intention, and provided he pays to the owner a royalty of 10 per cent. on the published price of all copies sold.

Copyright in a musical work is not infringed by the construction of mechanical contrivances for performing the work, if such were previously made by the owner of the copyright, or with his express or implied consent, and if notice has been given, and the specified royalties paid. The Judicial Committee of the Privy Council has power to allow the reproduction of a literary, dramatic, or musical work which is being withheld from the public by the owner of the copyright after the author's death, and that on such terms as the committee may consider proper. An action for infringement cannot be commenced after the lapse of three years from the date of the infringement. The importation into the United Kingdom of copies which, if made there, would infringe copyright may be prevented by notice to the Commissioners of Customs and Excise of the existence of copyright.

The publisher of every book published in the United Kingdom must, within one month after publication, deliver a copy to the British Museum, and must, if required within one year after publication, deliver a copy within one month of the demand or the publication, whichever is the later, to each of these libraries—the Bodleian, Oxford; the University Library, Cambridge; the Advocates' Library, Edinburgh; and Trinity College, Dublin; and, subject to qualifications, to the National Library of Wales.

The Act applies in its main provisions not only to the British Isles, but also to Australia, Newfoundland, India (as modified by the Indian Copyright Act, 1914), the Crown Colonies, the Channel Islands, the British Protectorates, and Cyprus. Thus, owing to the remaining self-governing dominions having failed to adopt the Act, the unification of the law of copyright throughout the empire, aimed at by the Act, has not been effected. New Zealand, however, has provided "adequate protection" for British authors, and consequently the benefits of the Act have been extended to works first published there, and to works made by authors resident there at the time of the making of the works. Canada and South Africa have not adopted the Act nor passed "substantially identical" legislation, and the earlier enactments, so far as operative there prior to 1912, remain in force.

International Copyright.—As regards international copyright, the Berne Convention of 1908 has been ratified by Great Britain, France, Belgium, Italy, Germany, Denmark, Japan, Norway, Sweden, Spain, Switzerland, Portugal, the Netherlands, Luxemburg, Monaco, Tunis, Haiti, and Siberia. By Section 29 of the Act, therefore, works first published in these countries, and unpublished works the authors of which are subjects of, or resident in, these countries when the works are made, receive protection throughout those parts of the empire to which the Act extends, while reciprocal protection is granted in each of these countries to works first published in such parts of the empire, and to unpublished works of British authors, or of authors resident in such parts at the time of executing the works. By special war legislation licence could be obtained from the Controller of Patents to publish enemy copyright works.

Published works are protected in the United States of America if within thirty days after the publication an edition is both printed and issued there; while protection is afforded to works of American authors if publication takes place in the United States and in the British Dominions within a period of fourteen days. BIBLIOGRAPHY: T. E. Scrutton, *Law of Copyright*; E. J. MacGillivray, *A Treatise on the Law of Copyright*; L. C. F. Oldfield, *The Law of Copyright*; W. Briggs, *The Law of International Copyright*.

COQUELIN, Benoît Constant. Distinguished French actor, born at Boulogne-sur-Mer in 1841, died in Paris 1909. He is known as Coquelin Aîné, to distinguish him from his less famous brother, also an actor (1848-1909). Coquelin Aîné studied at the Conservatoire, Paris, and made his debut at the Comédie Française in 1860, where he appeared in *Le dépit amoureux*, *Le mariage de Figaro*, *Le barbier de Séville*, *Gringoire*, *Tabarin*, and *Le monde où l'on s'ennuie*. In 1886 he retired from the Comédie Française and toured in America. In 1897 he produced Rostand's *Cyrano de Bergerac* at the Porte-St.-Martin, Paris, himself playing the title rôle, his most famous character. In 1900 he visited America accompanied by Sarah Bernhardt, playing Flambeau to Sarah's Duc de Reichstadt in Rostand's *L'Aiglon*. He played in London in 1902 and 1908. Among his publications is *L'Art et le comédien*.

COQUETTA BARK (ko-ket'a). The name of a bark, from *Cinchona lancifolia*, which contains quinine in it.

COQUILLA-NUT (ko-kwil'la). The seed of the piassava or piaçaba palm (*Attalĕa funifĕra*), one of the coco-nut group, a native of Brazil. The nuts are 3 or 4 inches long, oval, of a rich brown colour and very hard, and are used in turnery for making umbrella handles.

COQUIMBO (ko-kim'bō), or **LA SERENA.** A town of Chile, capital of the province of Coquimbo, standing near the sea, on a river of the same name. It is the see of a bishop. Pop. 6330.—**Porto Coquimbo,** the port of the above, from which it is distant 7 miles to the south-west, has smelting-works and a large export trade chiefly in copper and the precious metals. Pop. 17,121.—The province (15,333 sq. miles) is rich in copper, silver, gold, and other metals, and is mountainous. Pop. (1930), 198,33

COQUITO (kō-kē'tō). The *Jubaea spectabilis*, a very beautiful palm of Chile, allied to the coco-nut, growing to the height of 40 or 50 feet, yielding a rich sweet sap, which when boiled is called palm-honey.

Ancient Briton in Coracle

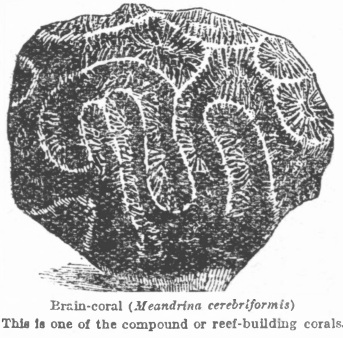
COR'ACLE. A small boat or canoe of oval form and made of wicker-work covered with skins. It was used by the ancient Britons, and something similar is still in use amongst Welsh fishermen and on the Irish lakes. Julius Cæsar, who used coracles of the British pattern in his Spanish campaign, has given a description of the coracle (*De Bello Civili*, i. 54). He says that the keels and ribs were made of light wood, and the sides of wicker covered with skins.

COR'ACOID BONE. A bone in birds joining the sternum and shoulder-bone, and giving support to the wing. In mammals it is represented by the *coracoid process* of the scapula.

COR'AL. The name applied to the calcareous stony structures secreted by many of the Actinozoa (sea-anemones, etc.) which form one of the divisions of the cœlenterate zoophytes, and also applied to the animals themselves. Two kinds of corals are distinguished by naturalists, *sclerodermic* and *sclerobasic*, or those in which the calcareous skeleton is developed in the walls of the body, as in the reef-building corals, and those in which (as in the red coral of commerce) the skeleton is external or cuticular.

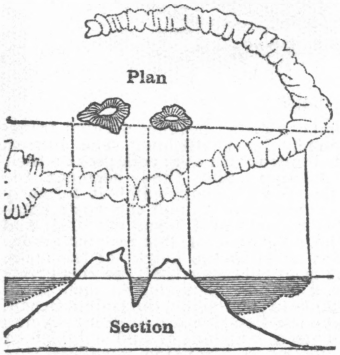
Reproduction takes place by ova, but chiefly by budding, the new individual remaining in organic union with the old. The coral masses grow not merely by the multiplication of individuals, but by the increase in height of each of the latter, which, as they grow, become divided transversely by partitions. The animal, distended with ova, collapses on their discharge, and thus becomes too small for the cup which it formerly occupied; it cuts off the waste space by a horizontal layer of coral, and the repetition of this process gradually adds to the height of the mass. It is in this way that the coral reefs and islands, occurring in such abundance in the Pacific, the Indian Ocean, and the Red Sea, are built up—works of such stupendous and astonishing bulk when compared with the tiny creatures that produce them.

Coral Reefs.—These coral reefs appear under three principal types, namely, the *fringing* reef, the *barrier* reef, and *atoll* or *lagoon* reef. According to Darwin's theory the latter two are merely developments of the



Brain-coral (*Meandrina cerebriformis*)
This is one of the compound or reef-building corals.

first. The fringing reef on the margin, say, of a South Sea island is the work of corals living near the shore. This island is supposed gradually to subside into the sea, but so slowly as to allow the coral polyps, which cannot exist at a greater depth than between 20 and 30 fathoms from the surface, to add to the height of the reef and keep themselves always at the same level. Thus, in the course of time, as the island sinks in the constantly receding margin, the coral formation will no longer be a fringing reef, but will stand out at sea, with water on all sides between it and the island. In this way the barrier reef is formed. But should the island continue to sink till it disappear altogether, the reef is then left as a huge



An encircling Coral Reef in Plan and Section

By gradual sinking of the island, with corresponding upgrowth of coral, an atoll might be formed.

circle enclosing a lagoon and constituting the atoll. By accretions of various kinds this finally rises above the surface of the sea, is taken possession of by a tropical vegetation, and at length becomes the habitation of man. Darwin's theory is by many not considered satisfactory, however, and the formation of the coral reefs is explained without the theory of subsidence by Louis Agassiz, Karl Semper, Sir J. Murray, and others. In all probability there is truth in both views, for there is no reason to believe that all reefs have been formed in the same way.

Coral Fishery.—The coral of commerce is the production of various polyps, and is of different colours and internal structure. The red, pink, and black sorts are the most highly prized. The red coral has a branching shrub-like form, and, as well as other sorts, is found abundantly in the Mediterranean. The coral fishery, as it is called, is carried on in various parts of the Mediterranean, the principal localities being the south-west coast of Corsica, where the finest quality is found, the coast of South Italy, and the north coast of Africa (Algeria and Tunis). The raw coral is wrought chiefly in Leghorn, Genoa, and Naples. The coral is brought up from the bottom by means of net-work bags with wide meshes, attached to cross-beams of wood that are let down from a vessel by a line. Italy takes the leading part both in fishing for coral and in its preparation for the market. It consists chiefly of carbonate of lime, and is capable of taking a good polish. The finest tints of rose-pink coral fetch from £80 to £120 an ounce.

—BIBLIOGRAPHY: *C. Darwin, The Structure and Distribution of Coral Islands*; J. D. Dana, *Corals and Coral Islands*; W. Savile Kent, *The Great Barrier Reef of Australia*.

CORAL FISHES. A name given to several fishes of different genera, belonging to the Chætodontidæ. They are found in all tropical seas, especially about coral reefs, and are all brilliantly coloured. The most important is the *Holocanthus imperător*, the "emperor of Japan," which measures about 15 inches in length, and is the best flavoured of all the Indo-Pacific fishes. The body is marked with horizontal golden-yellow stripes on a dark-blue background.

CORALLINACEÆ. A family of Red Seaweeds, characterized by the heavy incrustation of lime on the thallus. Some, as Corallina, are small shrubby plants of the surf-belt; others form crusts on rocks (Melobesia) or large agglomerations around shells, bits of seaweed, etc., often at great depths (Lithothamnion). In warm seas Corallinaceæ sometimes play a considerable part in the formation of coral reefs. Several species are parasites on other Algæ.

COR'ALLINE. A term popularly applied both to seaweed with rigid calcareous fronds and to many of the zoophytes.

CORALLINE. A red colouring-matter obtained by heating phenol with sulphuric and oxalic acids. It is used for dyeing silk and wool, and is also printed upon cotton.

CORALLINE CRAG. A name for the lowest division of the Pliocene strata in the east of England, derived from the numerous and beautifully preserved polyzoa, once called coralines, included among its fossils. The beds are mostly unconsolidated shelly sands.

CORAL RAG, or **CORALLINE OOLITE.** In geology, a member of the Upper Jurassic series in central England, between the Oxford and the Kimmeridge clays. The name of this somewhat rubbly limestone is derived from the abundant fossil corals that it contains.

CORAL SEA. Part of the Pacific on the north-east of Australia, between it and the Solomon Islands and the New Hebrides. It is so named on account of the number of coral reefs found therein.

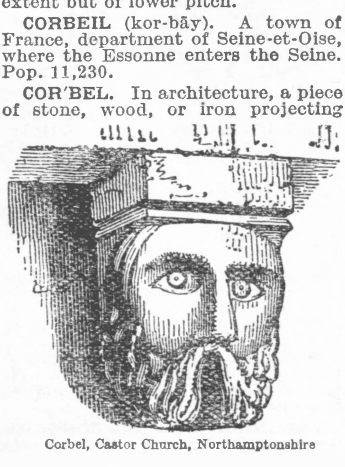
CORAL TREE. The name of leguminous trees and shrubs of the genus Erythrina, natives of Africa and America, with trifoliolate leaves and beautiful scarlet spikes of papilionaceous flowers.

CORAM, Thomas. Philanthropist, originator of the Foundling Hospital, London, born about 1668, died in 1751. He was closely connected with the American colonies, lived for a time in Massachusetts, settled in London in 1719, and engaged in business of some kind. He laboured for many years to get the Foundling Hospital established, and lived to see the movement successful, Hogarth taking an active part in it and presenting to the hospital his fine portrait of Coram. He is buried in the chapel of the Foundling Hospital, which did not long continue to be devoted to foundlings.

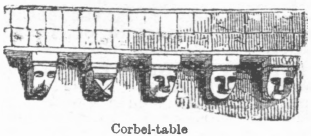
COR ANGLAIS (kor-ăn-glā; Fr., "English horn"). A wind-instrument of the reed kind, similar to the oboe, and possessing a compass of like extent but of lower pitch.

CORBEIL (kor-bāy). A town of France, department of Seine-et-Oise, where the Essonne enters the Seine. Pop. 11,230.

COR'BEL. In architecture, a piece of stone, wood, or iron projecting from the face of a wall to support some superincumbent mass. Corbels are of a great variety of forms, and



Corbel, Castor Church, Northamptonshire



Corbel-table

are ornamented in many ways. They are sometimes used in rows to support a projecting course called a *corbel-table.*

CORBET, Richard. English bishop and poet, born 1582, died 1635; was educated at Westminster school and Christ Church, Oxford, took orders, became university proctor, and was appointed one of the royal chaplains by James I. After being Dean of Christ Church he was made Bishop of Oxford (1624), and was translated to Norwich in 1632. He had a life-long reputation as a wit, jester, and convivial spirit, and was on intimate terms with Ben Jonson. His poems are mostly satiric and humorous; the best known is a lament for the fairies (*Fairies' Farewell*). His verses were first published in 1647, under the title of *Poetica Stromata.*

CORBIE STEPS. In architecture, steps into which the sides of gables from the eaves to the apex are broken. They are common in old Scottish architecture, into which they were probably introduced from France.

CORCHORUS (kor'ko-rus). The genus of plants to which jute belongs, ord. Tiliaceæ (the lime tree). They are herbs or small shrubs with serrated leaves and small yellow flowers. *Corchŏrus olitōrius,* also called Jews' mallow, is a native of India. The *Corchŏrus capsulāris,* sometimes called *Chinese hemp,* is also a native of India, and the fibres of both form a large proportion of the jute that is imported into Europe. *See* JUTE.

CORCY'RA. *See* CORFU.

CORDAITEÆ, or **CORDAITALES.** A group of extinct gymnosperms, mainly of the Carboniferous age, holding a position roughly intermediate between cycads and conifers, but with many special features. Their wood was of coniferous type, barely distinguishable from that of living Araucarias. The ♀ flowers resembled those of conifers, the ovule and seed, however, being more cycad-like. The ♂ flowers were borne in peculiar catkins, which have no parallel among other gymnosperms. Cordaiteæ were trees with tall (up to

100 feet), rather slender trunks ; and large, narrow, simple, parallel-veined leaves as much as a yard in length, externally recalling the leaves of such monocotyledons as Dracæna, but with the internal structure of a cycad leaflet.

CORDAY D'ARMONT (kor-dā-därmoṇ). Marie Anne Charlotte, commonly called Charlotte Corday, was born in Normandy, in 1768, of a family which counted the poet Corneille amongst its ancestors. Her lover, an officer in the garrison of Caen, was accused by Marat as a conspirator against the republic, and assassinated by villains hired for that purpose. This, as well as a deep-rooted hatred against all oppressors, determined Charlotte Corday to free her country from Marat. Having obtained an interview with Marat at his own house, she plunged a dinner-knife into his side, and gave herself up to the attendants who rushed in at his cries. When tried for the murder before the revolutionary tribunals, her air was dignified and her replies firm ; she made no pretence of denial, but spoke of the deed as a duty which she owed to her country. While she was being detained at the Conciergerie her portrait (now in the Museum of Versailles) was painted by J. J. Hauer. Being condemned to the guillotine, she was executed on 17th July, 1793, retaining her calmness to the last.—Cf. Defrance, *Charlotte Corday et la mort de Marat.*

CORDELIERS (kor'de-lērz, that is, "cord-wearers"). Originally a branch of the order of Franciscan monks who wore as part of their dress a girdle of knotted cords. (*See* FRANCISCANS.) Afterwards the name was given to a club or society of Jacobins, including Marat, Danton, and Camille Desmoulins. The club lasted from 1792 to 1794, and took its name from the place of meeting.

CORDERIUS, or **CORDERY.** Names by which the French teacher *Mathurin Cordier* became commonly known. Born in 1479, he taught at Paris—where he had Calvin as a pupil—and elsewhere in France ; passed into Switzerland and taught at Geneva, where he died in 1564. He produced various school-books, the best known being *Colloquia Scholastica*, a manual for teaching Latin, at one time familiar in this country as *Cordery's Colloquies.*

CORDILLERAS (kor-dil-yā'rāz). A Spanish name given to the great chains of the Andes and of Mexico and Central America.

CORDITE. A smokeless explosive for use in small-arms, machine- and quick-firing guns, and ordnance, so named from being made in cord-like forms. In appearance it is like yellow gutta-percha, and when its ingredients are worked up into a mass it receives the cord-like character by being pressed through openings in dies. In the same way as the grains of charcoal powder are made of various sizes to suit various guns, so cordite is made of various diameters. It consists of 58 per cent. nitro-glycerine, 37 per cent. gun-cotton, and 5 per cent. vaseline, which is added to make the cordite flexible and reduce friction in the incorporating process, while it also counteracts metallic fouling in small-arms. Cordite M.D. (i.e. modified cordite) carries less than 30 per cent. of nitro-glycerine, with a corresponding increase of nitro-cellulose. The latest "mark" of cordite contains about 15 per cent. of nitro-glycerine and over 80 per cent. nitro-cellulose. The cordite is wound on reels, and is afterwards cut up in lengths suitable for the various cartridges.

Cordite is in some ways less satisfactory than other explosives, as it develops great heat and causes erosion; but it is the most stable explosive both chemically and ballistically in all climates, hot and cold. It is therefore the most suitable for use in the British Empire. Wet cordite can be fired ; moisture does not deteriorate it. As it is somewhat difficult to ignite, an "igniter" of black gunpowder is put into the gun cartridges to extend the flash of the firing-tube. In the open air it burns quietly.

COR'DOBA. A town of the Argentine Republic, capital of province of same name. It occupies a beautiful site on the Primero, and has various important buildings and institutions, including a university, founded in 1613. The city itself was founded in 1573, and now possesses tramways, water-works, and the other equipments of a modern city. Pop. (1930), 253,182.—The province has an area of 66,912 sq. miles, a pop. of 1,084,682.

COR'DOBA. A town of Mexico, state of Vera Cruz, on the railway from Vera Cruz to Mexico, in a fertile district, rich in coffee plantations. Pop. 10,300.

CORDON BLEU. The sky-blue ribbon of the knights grand cross of the order of the Holy Ghost, the highest order of the Bourbon Kings of France. Like the blue ribbon of the English Garter, it was taken as the type of the highest reward. The term *cordon bleu* is familiarly applied to a good cook.

COR'DOVA, in Spanish **CORDOBA.** An ancient Spanish city on the

Guadalquivir, in Andalusia, capital of a province of the same name. A part of the town is of Roman, another of Moorish origin ; it is surrounded by old ruinous walls and towers ; the streets are narrow, crooked, and dirty, and the place generally a scene of decay ; the principal square, however, is distinguished for its size and the beauty of its colonnade. The cathedral is a splendid building, originally a mosque, begun in the eighth century by King Abderrahman I. and converted into a Christian church in 1238. Near the cathedral the river is spanned by a Moorish bridge of 16 arches. The town is well supplied with schools, hospitals, and other institutions. Under the Moors the leather manufactured here (cordovan) was exported in all directions. At present gold and silver wares, pottery, and cloth are manufactured.

Cordova, founded by the Phœnicians, was occupied by the Romans in 152 B.C., and became the first Roman *colonia* in Spain. Under the Moors, after 756, it became the capital of Arabian Spain and the centre of Arabian splendour as well as of learning, art, science, and industry under the caliphs of the West. At this time it is said to have had a pop. of 1,000,000. With the decay of the Moorish Empire it gradually sank in importance, and in the thirteenth century fell into the hands of Ferdinand III. of Castile. Pop. 84,525.

The province includes the fertile and beautiful valley of the Guadalquivir and the mountains of Sierra Morena. Area, 5299 sq miles; pop. 618,487.

COR'DOVAN. A fine leather which took its name from the Spanish city of Cordova, where it was manufactured in large quantities. Much is now made in Northern Africa and the Levant.

CORDUROY'. A thick cotton stuff corded or ribbed on the surface.—**Corduroy road**, in North America, a road constructed with logs laid together over swamps or marshy places for carriages to pass over. Such roads were also constructed in the European War to assist transport over badly shelled or marshy ground.

CORD-WOOD. Wood cut and piled for sale by the cord, in distinction from long wood ; properly, wood cut to the length of 4 feet.

COR'DYCEPS. A genus of ascomycetous Fungi, section Pyrenomycetes, parasites mainly on caterpillars, grubs, etc., the bodies of which they mummify. *C. militaris* is a British species, with a fine, scarlet fructification. Some species are regarded as valuable drugs by the Chinese, probably without sufficient reason.

CORE'A, or KORE'A (Chosen). A territory in Eastern Asia, consisting chiefly of a peninsula lying north-east of China, bounded north by Manchuria, east by the Sea of Japan, south by the Strait of Corea, which parts it from the Japanese Islands, west by the Yellow Sea. The chief boundaries in the north are the Rivers Yalu and Tumen, and mountain ranges. Pop. estimated at about 19,331,061, the Japanese numbering 488,478 ; area, 85,228 sq. miles. Keijo-fu (Seoul) is the capital.

Physical Features.—The peninsula is traversed through its length by a mountain range, abrupt and precipitous on the east, but forming a gentle slope on the west side, which, being watered by the principal rivers of the country, is exceedingly fertile.

Products.—In the north the only grain that can be grown is barley ; but in the south, wheat, cotton, rice, millet, and hemp are grown extensively. The ginseng root is a production greatly valued in China and Japan.

Animals.—The domestic animals are oxen, pigs, goats, dogs, and cats, and a small breed of horses. Oxen only are used for agricultural labours, the horse being reserved expressly for the saddle. The whale fisheries are of great importance and value.

Manufactures.—The manufactures are, generally speaking, rough, and mostly confined to tissues of hemp and cotton, silk, paper, and pottery.

Minerals.—The peninsula abounds in minerals, gold, silver, iron, copper, lead, and coal, and the natives show much artistic skill in the art of working metals. Graphite and mica are found in considerable quantities.

History.—China was long suzerain of Corea, but the war in 1894-95 between China and Japan ended this, the Chinese withdrawing in favour of the Japanese. Through the successes of the Japanese in their war with Russia, in 1904-5, Corea fell entirely under their influence ; and in 1910 (22nd Aug.) it was definitely annexed to the Japanese Empire. The title of the country was changed back to "Chosen" from Tai-Hau, which had been adopted in 1897.

Buddhism, Confucianism, and Taoism are the chief religions. The Corean language is quite distinct from Chinese ; but all the educated classes use the Chinese system of writing. A practical system of instruction has been introduced by the Japanese, and technical and industrial schools are rapidly springing up. The Coreans resemble the Japanese more than the Chinese. Several ports have been opened for foreign trade ; exports (mainly rice and minerals) have an annual value of about £23,000,000.

The exports are chiefly beans, rice, hides, live-stock, and gold; the imports chiefly cotton goods. There were, in 1930, 11,464 miles of road; the length of railways (1931) was 2395 miles. Since 1919 Corea is treated as an integral part of Japan, and the Coreans are placed on the same footing as the Japanese.—BIBLIOGRAPHY: John Ross, *History of Corea, Ancient and Modern*; Angus Hamilton, *Korea*; J. H. Longford, *The Story of Korea*; W. E. Griffis, *Corea: the Hermit Nation*.

CORELLI, Marie. Novelist, born in 1864, adopted daughter of the late Charles Mackay, the well-known author, educated partly in France, early began to write, and published her first book, *A Romance of Two Worlds*, in 1886. Since then she has written a number of novels, most of which have been very popular, and more or less deservedly so for their cleverness if for nothing else, including *The Sorrows of Satan*, *The Mighty Atom*, *The Murder of Delicia*, *The Master Christian*, *God's Good Man*, *Holy Orders*, *The Life Everlasting*, and *The Young Diana*. She has been active as an opponent of certain measures regarded by her as desecrations of Stratford-on-Avon. She died in 1924.

CORENTYNE (kor'en-tin). A river of S. America separating British and Dutch Guiana. It has a course of 300 miles, and is navigable 150 miles.

CORFE CASTLE. An English castle in Dorsetshire, now in ruins, standing a little north of a small town, to which it gives its name, and with which it is connected by a bridge of four arches. It was built by King Edgar, and at its gate his son Edward the Martyr was murdered by his stepmother, Elfrida, in 979. It was defended by Lady Bankes (1643) for six weeks against the Parliamentarians, and dismantled by Fairfax in 1646.

COR'FU (anciently **Corcy'ra**). The most northerly of the Ionian Islands, at the mouth of the Adriatic, near the coast of Albania, about 40 miles long, and from 15 to 20 wide; area, 275 sq. miles. It forms, with some minor islands, a nomarchy of Greece. The surface rises at one point to the height of 3000 feet, the scenery is beautiful, the climate pleasant and healthy, the soil fertile. Oranges, citrons, grapes, honey, wax, oil, and salt are abundant. A Corinthian colony settled in the island in the eighth century B.C. The Venetians possessed Corfu from 1386 to 1797, the British from 1815 to 1864. Pop. 106,251.—**Corfu**, the capital, is finely situated on a promontory, which terminates in a huge insulated rock, crowned by the citadel; the streets are Italian in style; chief buildings, the cathedral, government palace, and Ionian academy. There is a good harbour and considerable trade. From Nov. 1915 to 1918 the Serbian Government was established in Corfu. Pop. 32,221.—Cf. S. Atkinson, *An Artist in Corfu*.

CORIAN'DER (*Coriandrum sativum*). An umbelliferous plant, native of Italy, and cultivated in other parts of Europe. It is wild in the warm dry parts of Southern Europe, but not in Britain. The whole plant has an unpleasant smell, but the fruit, improperly called seed, is very agreeable and aromatic when dry. It is used as a carminative and aromatic in medicine, and as an ingredient in cookery and confectionery.

CORIA'RIA. A genus of plants, type of a small nat. ord. of polypetalous dicotyledons. *Coriaria myrtifolia* is a shrub inhabiting the south of Europe and employed by dyers for staining black, and also used in tanning, and hence called *tanner's sumach*.

CORIGLIANO (ko-rēl-yē-ä'nō). A town of S. Italy, province of Cosenza, on a hill above the right bank of the Corigliano, near the site of the ancient Sybaris, of which no vestiges remain. Pop. 15,650.

CORIN'GA. A seaport in India, in the Godavari district, Presidency of Madras. It had once a great trade. Pop. 15,650.

CORIN'NA. Surnamed Myia ("The Fly"), an ancient Greek poetess of Tanagra, in Bœotia, contemporary with Pindar (about 500 B.C.), whom she is said to have conquered five times at musical contests. Only a few fragments of her songs have come down to us.—Cf. Bergk, *Poetæ Lyrici Græci*.

COR'INTH. A once celebrated city upon the isthmus of the same name, which unites Peloponnesus with Northern Greece. It was renowned among the cities of Greece, commanded by its advantageous position a most important transit trade, and possessed all the splendour which wealth and luxury could create; while its citadel, the Acrocorinthus, nearly 2000 feet high, rendered it a strong fortress. Only a few ruins remain to attest its ancient magnificence. It had two harbours, Lechæum on the west side of the isthmus, on what is now the Gulf of Corinth or Lepanto, and Cenchreæ, on the Gulf of Athens or Ægina (ancient *Saronic Gulf*). Near Corinth were held the Isthmian games. Besides being one

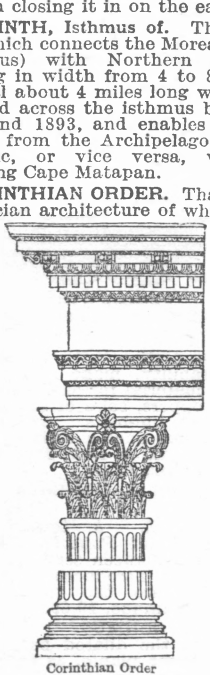
of the most magnificent, it was also one of the most voluptuous cities of Greece.

After many political vicissitudes Corinth became the head of the Achæan League, and was conquered and destroyed by the Roman consul Mummius, 146 B.C. Julius Cæsar, about a hundred years later, rebuilt it; but its commerce could not be restored, though it became a place of note and importance. St. Paul lived here a year and a half, and two of his epistles are addressed to the Corinthians.—**New Corinth** is a village on the shore of the gulf, several miles N.W. of the site of ancient Corinth; it is the seat of an archbishop. Pop. 5350.

CORINTH, Gulf of, or **GULF OF LEPANTO.** A beautiful inlet of the Mediterranean, about 80 miles long, between the Peloponnesus and Northern Greece, having the Isthmus of Corinth closing it in on the east.

CORINTH, Isthmus of. The isthmus which connects the Morea (Peloponnesus) with Northern Greece, varying in width from 4 to 8 miles. A canal about 4 miles long was constructed across the isthmus between 1882 and 1893, and enables vessels to sail from the Archipelago to the Adriatic, or vice versa, without rounding Cape Matapan.

CORINTHIAN ORDER. That order of Grecian architecture of which the



Corinthian Order

most characteristic feature is the capital of the column, which is adorned with beautifully carved acanthus leaves, but varies considerably in minor details. The column is generally fluted, with a fillet between the flutings, and stands upon a base. The entablature is variously decorated, especially the cornice; the frieze may be quite plain, or sculptured with foliage and animals. The Corinthian order was not very common in Greece before the time of Alexander the Great; among the Romans it was much employed.

CORINTHIANS, Epistles to the. Two epistles addressed to the Church at Corinth about A.D. 57 or 58, which have been admitted as genuine writings of St. Paul by even the most critical assailants of the New Testament canon. They are most instructive from the insight which they furnish into the character of St. Paul himself, and the constitution, parties, and heresies of the Apostolic Church. See articles in *Hastings's Dictionary of the Bible* and in *Catholic Encyclopedia*.

CORIN'TO. A seaport of Central America, state of Nicaragua, on the Pacific, connected by railway with important inland towns, and carrying on a considerable trade in coffee and mahogany. Pop. 3500.

CORIOLA'NUS. The name given to an ancient Roman, Gaius, or more properly Gnæus, Marcius, because the city of Corioli, the capital of the kingdom of the Volsci, was taken almost solely by his exertions. He was banished for seeking to deprive the plebeians of their hard-earned privileges, and in particular of the tribuneship; and seeking revenge, he took refuge amongst the Volsci, the bitterest enemies of Rome, and prevailed upon them to go to war with her. The Volscian army, after making itself master of the cities of Latium, was encamped in sight of Rome before troops could be raised for the defence. The Roman Senate made unavailing overtures for peace, till at length the tears of Veturia his mother, and Volumnia his wife, when they appeared at the head of the Roman matrons, induced Coriolanus to withdraw his army from before Rome. He was afterwards assassinated in a tumult while attempting to justify his conduct. The story of Coriolanus, which is now regarded as legendary, forms the subject of one of Shakespeare's plays.

CORK. A city in the Irish Free State, capital of County Cork, situated on the River Lee. It is 15 miles from the sea, and besides an upper harbour at the city itself, and quays extending over 4 miles in length, there is a lower harbour at Queenstown, 11 miles below the town. The entrance, deep and narrow, is strongly

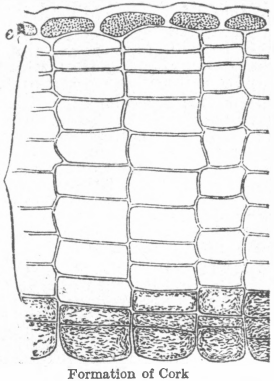
fortified. Cork is the third city in Ireland, and exports quantities of grain, butter, bacon, hams, eggs, and live-stock. The principal industries are tanning, distilling, brewing, and the making of tweeds, ginghams, friezes, and chemical manures. There are also iron-foundries.

The principal buildings are the Protestant and Roman Catholic cathedrals, exchange, custom-house, chamber of commerce, court-house, municipal buildings, new library, schools, and University College. There is a naval dockyard at Haulbowline, an island within Cork harbour, but since the formation of the Irish Free State this has been in the charge of a care and maintenance party. Population (census of 1926), 78,468. Cork has always been a hotbed of Anglophobia, and was for many years a centre of the Sinn Fein movement. A disastrous fire broke out there in 1920 as the result of rioting.

The County is the most southerly and the largest in Ireland, having an area of 2890 sq. miles, of which less than a fourth is under crops. The west part is mountainous, the north and east very fertile. The coast is indented with numerous bays and inlets, of which the more important are Bantry Bay, Kinsale and Cork harbours. The climate is remarkably mild, though moist. The county is watered by the Bandon, Lee, and Blackwater. Cattle, sheep, pigs, and quantities of butter are exported. The fisheries are important. The county has seven political divisions, each sending a member to Parliament. The county town is Cork; other towns are Queenstown, Fermoy, Youghal, Bandon, Mallow, and Kinsale. Pop. (1926), 365,722.

CORK. A tissue in which the cell-walls are chemically modified so as to be impervious to water and gases. The exact chemical nature of such "suberized" walls is not known, but it is probable that certain fatty acids (e.g. *suberic acid*) take a leading part in their composition. Ordinary potato-peel is a good example of pure corky tissue. Cork forms a large proportion of bark, the permanent protective covering of stems and roots; communication between living tissues and the external medium through a coating of bark or cork is maintained by means of special pores called *lenticels*. Bottle-cork is the outer bark of the cork-oak (*Quercus Suber*), a native of South Europe and North Africa, the best cork being exported from Spain and Portugal. *See* BARK; OAK; PHELLOGEN.

The tree is stripped for the first time when it is fifteen or twenty years old, and every eight or ten years afterwards. The quality of the cork improves with every stripping, and the tree may live for one hundred and fifty years. To remove the outer bark, it is cut lengthwise and crosswise by knives of special make, great care being taken not to injure the inner bark. The pieces are soaked in water, pressed, and charred, and are sent to market in bales. Cork is highly compressible, and when a cylindrical piece is made to contract laterally, it is extended very little lengthwise, so that it becomes denser. Its specific gravity and conducting power for heat are very low.



Formation of Cork

e, Epidermis. *k*, Cork cells with the cork cambium at base.

These properties, with its strength and durability, make cork an admirable material for such articles as bottle-stoppers, soles of shoes, floor-mats, and life-belts. Cork-cutting by hand was once a thriving trade, but the work is now done almost entirely by machinery.

CORK, Earl of. *See* BOYLE, RICHARD.

CORLEO'NE. A town, Sicily, 22 miles S. of Palermo. It was originally a Saracen settlement, but Frederick II. introduced a colony of Lombards into the town. Pop. 15,300; commune, 19,690.

CORM, or CORMUS. In botany, a solid bulb, the dilated base of the stems of some plants, as the crocus and cyclamen.

CORMOPHYTES. In botany, those plants in which there is a distinct leafy shoot; contrasted with Thallophytes. They comprise the phanero-

gams and the higher cryptogams (Bryophytes and Pteridophytes).

COR'MORANT (from Fr. *cormoran*, Lat. *corvus marinus*, a sea-crow). The name of several large web-footed

Cormorant (*Phalacrocorax carbo*)

birds of the pelican family, or forming a family by themselves. They have a longish and strongly hooked bill, long neck, short wings, and rather long rounded tail; all the toes are united by a web, and, though excellent swimmers, they are able to perch on trees; colour generally black or dark. The common cormorant of Europe (*Phalacrocórax carbo*) is larger than a goose, but with smaller wings. It occupies cliffs by the sea, feeds on fish, and is extremely voracious. It dives and swims with great power, and pursues its prey beneath the surface of the water, often to a great depth.

Amongst the Chinese cormorants have long been trained to fish for nan. The practice is still regularly 'ollowed among the Chinese and Japanese, and has also been revived is a sport in Great Britain. At first a ring is placed on the lower part of he bird's neck to prevent it swallowng the prey, and in time it learns to leliver the fish to its master without uch a precaution being necessary.

Another British cormorant is the reen cormorant or shag (*P. graculus*). t is smaller than the common cornorant. Both these species are ound also on the eastern coasts of merica, and there are various other merican as well as Australian species.

CORN (Fr. *corne*, Lat. *cornu*, a orn). In pathology, a hardened ortion of the cuticle of the foot, ppearing as a sort of distinct growth, roduced by pressure. Corns are nerally found on the outside of the es, but sometimes between them, the sides of the foot, or even on the ball. They appear at first as small dark points in the hardened skin, and in this state stimulants or escharotics, as nitrate of silver (lunar caustic), are recommended. Perhaps the most efficacious remedy for corns is the application of glacial acetic acid night and morning.

CORN. The generic term for all kinds of grain used for making bread, and is applied specifically to the principal bread-stuff: in England to wheat, in the United States generally to maize, and frequently in Scotland to oats.

CORN, Indian. *See* MAIZE.

CORNA'CEÆ. A nat. ord. of polypetalous dicotyledons, consisting of about 100 species, two of which are found in Britain, *Cornus suecica*, a lowly alpine plant, and *C. sanguinea*, the common dogwood or prickwood. Several plants of this order are of service as tonics and for the cure of ague, and in America the bark of the *Cornus florida* is sometimes used as a substitute for Peruvian bark. *See* CORNEL.

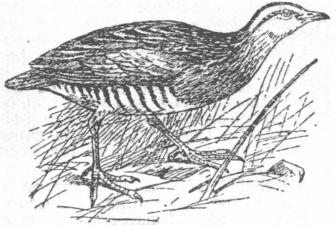
CORNBRASH. A local name in England for a rubbly limestone, forming a soil extensively cultivated in Wiltshire for the growth of corn. The term is used by geologists to indicate the strata which yield the soil, the highest member of the Bathonian stage and thus of the Middle Jurassic series.

CORN-COCKLE. A well-known weed (*Agrostemma Githago*), nat. ord.

Corn-cockle (*Agrostemma Githago*)

Caryophyllaceæ, with large purple flowers, very troublesome amongst crops of grain. Its seeds contain the poisonous principle called *saponine*.

CORN-CRAKE, or **LANDRAIL** (*Crex pratensis*). A species of bird of the ord. Grallæ or waders, and of the family Rallidæ or rails. The crakes differ from the rails proper (Rallus) in having the bill shorter. The common crake of Britain is of a reddish-brown colour. It lives in fields and meadows, and nestles and runs among the long grass. The name is expressive of its cry. It feeds on worms and insects. It is a bird of passage, and is found in



Corn-crake or Landrail (*Crex pratensis*)

summer throughout Central Europe, Russia, Norway, and Sweden, though scarce in the extreme north. In winter it frequents the southern parts of Europe, including the Mediterranean coasts of Africa.

CORNEILLE (kor-nā-yė), **Pierre.** The father of French tragedy and classic comedy, was born at Rouen in 1606, at which place his father was Advocate-General; died in 1684. He began his dramatic career with comedy, and a series of vigorous dramas, *Mélite* (1629), *Clitandre*, *La Veuve*, *La Suivante*, and *La Place Royale*, announced the advent of a dramatist of a high order.

In 1635 he produced his earliest tragedy, the *Medée*; but it was not till the appearance of his next work, the famous *Cid*, that Corneille's claim was recognized to a place amongst the great tragic poets. The *Cid* was an imitation of a Spanish drama, based on the *Mocedades del Cid* of Guillem de Castro, and though gravely defective in the improbabilities of the plot and other respects, achieved an immense success for a certain sublimity of sentiment and oftiness of ideal, which are the native characteristics of Corneille's poetry. After the *Cid* appeared in rapid succession *Horace* (1639); *Cinna* (1639), his masterpiece, according to Voltaire; and *Polyeucte* (1640), works which show Corneille's genius at its best. Many of his later pieces exhibit a marked decline.

Besides his dramas he wrote some elegies, sonnets, and epistles, as well as three prose essays on dramatic poetry. As a dramatist his merits are loftiness of sentiment and conception, admirably expressed in a bold and heroic style of versification and language. But in this constant straining after a heroic ideal he was apt to fall into a declamatory and inflated style.—BIBLIOGRAPHY: M. E. Picot, *Bibliographie Cornélienne*; J. A. Taschereau, *Histoire de la vie et des ouvrages de P. Corneille*; F. P. G. Guizot, *Corneille et son temps*; E. Faguet, *Corneille*.

CORNEILLE, Thomas. Brother of the preceding, was born at Rouen in 1625, died in 1709. The brothers married two sisters, and lived in the same house in the utmost harmony. Thomas began with comedies, which were imitations of the Spanish school, and were received with even greater applause than those of his brother. The first was *Les Engagements du Hasard* (1647). His best tragedy is *Ariane* (1672). He is a dramatist of very secondary rank, laborious and cultivated, but wanting in original power.

CORNEL, or **CORNELIAN TREE** (*Cornus mascula*). A species of dogwood, a tree or shrub of the ord. Cornaceæ, distinguished by the hardness of its wood, a native of Asia and the south of Europe, cultivated as an ornamental plant in Britain. Its leaves are oval; the flowers, in small heads, are yellow; the berries are red and rather harsh, but are often made into sweetmeats.

CORNE'LIA. Daughter of Scipio Africanus the elder, married Tiberius Sempronius Gracchus, censor, 169 B.C., by whom she was the mother of the two tribunes Tiberius and Gaius Gracchus.

CORNE'LIAN, or **CARNELIAN.** A gem of a light-red or flesh colour. It consists of silica along with minute quantities of the oxides of iron, aluminium, and sometimes of other metals, and is used for seals, bracelets, necklaces, and other articles.

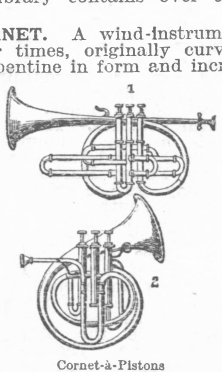
CORNE'LIUS, Peter von. German painter, born at Düsseldorf in 1784, died in 1867. He early exhibited a taste for art, and studied the great masters, especially Raphael. In 1811 he went to Rome, where, in conjunction with Overbeck, Veit, and other associates, he may be said to have founded a new school of German art, and revived frescopainting in imitation of Michael Angelo and Raphael. He left Rome

in 1819 for Düsseldorf, where he had been appointed director of the academy, but he soon settled in Munich to give his whole attention to the painting of the Glyptothek and the Ludwigskirche there. In these two great works he was assisted by his Munich pupils. In 1833 he made another visit to Rome, and in 1839 he visited Paris. In 1841 he was invited to Berlin by Frederick William IV., who entrusted him with the painting of the royal mausoleum or Campo Santo. The most celebrated cartoon in this series is the *Four Riders of the Apocalypse.*

CORNE'LIUS NEPOS. A Roman author of the first century B.C., the contemporary of Cicero and Catullus. The only extant work attributed to him is a collection of short biographies, probably an abridgment of a work written by Nepos. These biographies have long been a favourite school-book, and popular editions of them are very numerous.

CORNELL UNIVERSITY. At Ithaca in the state of New York, was established in 1865 with funds furnished from the income of 990,000 acres of public land allotted by Congress to the state and with a foundation of 500,000 dollars presented by the Hon. Ezra Cornell, much augmented by subsequent donations. The University is co-educational since 1872. There are five general courses, including classics, literature and philosophy, science, engineering, architecture, and agriculture, all of which lead to a bachelor's degree. The staff consists of 1131 professors, lecturers, etc., and there are nearly 6056 students. It has a medical college in New York. The library contains over 550,000 books.

CORNET. A wind-instrument of former times, originally curvilinear or serpentine in form and increasing in diameter from the mouthpiece to the lower end. The modern *cornet-à-pistons*, or cornopean, is a kind of keyed bugle which has a very agreeable tone, and is much used in orchestras and military bands. Several forms of it are in use.



Cornet-à-Pistons

1, Ordinary shape. 2, Circular shape.

CORNET. Formerly the lowest rank of commissioned officer in a regiment of cavalry in the British army, corresponding with the rank of ensign in the infantry. In 1871 this rank was abolished, that of second-lieutenant taking its place.

CORNE'TO. A cathedral town of Italy, province of Rome, on a lofty and precipitous volcanic ridge, 10 miles N. of Civita Vecchia. Its old walls, palaces, and other edifices present a picturesque appearance. The ancient Etruscan city of Tarquinii stood about a mile from Corneto, and many Etruscan relics have been obtained there. Pop. 7960.

COR'NICE. In architecture, any moulded projection which crowns or finishes the part to which it is affixed; specifically, the highest part of an entablature resting on the frieze. *See* COLUMN.

CORNISH DIAMOND. A variety of quartz found in Cornwall and employed even in the sixteenth century for personal ornaments. This variety being now scarce, ordinary rock-crystal is often used instead.

CORNISH LANGUAGE. A Celtic dialect spoken in Cornwall, which died out in the eighteenth century, though isolated words or terms are still in use among the fishers and miners, and some fragments of literature are still extant. It belonged to the Cymric division of Celtic, and is allied to the Welsh and Breton. *See* CELTS.

CORN LAWS. A name commonly given to certain statutes passed to protect the agricultural interest in Britain. The first form of interference by legislative enactment with the corn-trade in England, beginning soon after the Conquest, was the prohibition of exportation, an expedient in those times to prevent scarcity in a sudden emergency. The exportation of grain was prohibited in the reign of Edward III. in 1360-61, Calais and other appointed ports being excepted. This provision was relaxed by a statute of Richard II. in 1394, by which exportation was permitted from all ports not excepted by royal proclamation.

In 1436, under Henry VI., the exportation of grain was permitted without licence whenever the price of wheat did not exceed 6*s.* 8*d.* per

quarter, and barley 3*s*. 4*d*. In 1463 a statute of Edward IV. prohibited importation until the price exceeded the limit at which exportation was permitted. This was the beginning of protection, properly so called.

At the restoration of Charles II. duties were imposed both on exportation and importation, while the old principle of a standard price, beyond which exportation was prohibited, was retained. At the Revolution a new policy still more favourable to the agricultural interest was adopted. By Act 1 William and Mary, cap. xii., a bounty was granted on the exportation of corn, and the duties on exportation were abolished. The amount of the bounty was 5*s*. for every quarter of wheat exported while the price was at or under 48*s*., with corresponding prices for other grains. This is the only Corn-bounty Act of this country, and it was extended to Scotland by 5 Anne, cap. viii.

The exportation of grain reached its highest point about 1750. From this period Great Britain, which had always been normally a grain-exporting country, began, on account of the increase of population and expansion of mechanical industries, to fall off in this respect, and in 1778 became permanently a grain-importing country. From this time the main efforts of the agricultural interest, largely represented in the Parliament and the ruling classes of the kingdom, were concentrated on obtaining the imposition of prohibitory duties on foreign grain. In 1804, for instance, if the price of corn was below 63*s*. a prohibitory duty of 24*s*. 3*d*. was laid on what was imported; if between 63*s*. and 66*s*., a duty of 2*s*. 6*d*.; and only when the price at home had risen as high as 66*s*. per quarter was the foreign grain allowed to pass at a nominal duty of 6*d*.

With variations of more or less importance this sliding-scale of prohibitory duties continued in force till 1846, when Sir Robert Peel, influenced by the corn-law repeal agitation, and more especially by the Anti-Corn-law League, headed by Cobden and Bright, carried a measure repealing the duty on imported corn, except a nominal sum of 1*s*. per quarter, which also in 1869 was done away with, but was temporarily reimposed in 1902-3. A low duty on imported foreign corn was made part of Chamberlain's Tariff Reform scheme. — BIBLIOGRAPHY: A. H. D. Acland and C. Ransome, *Political History of England*; Thornton, *Historical Summary of the Corn Laws*; J. S. Nicholson, *History of English Corn Laws*.

CORN MARIGOLD (*Chrysanthĕmum segĕtum*). a common weed in British cornfields, of a rich orange colour.

CORN-MOTH. A small moth, the *Tinĕa granella*, the larva of which is exceedingly destructive to corn-sheaves in the field, and to stored grain, from eating into the grains. Salt, frequent turning, and many other expedients are employed to destroy the eggs.

CORN SALAD. *Valerianella olitoria* and other species of the same genus, ord. Valerianaceæ, natives of Britain and the continent of Europe, where they are frequently used in winter and spring. *V. olitoria*, called also lamb's-lettuce, is a weak, succulent herb 6 to 12 inches high, used as a salad in early spring.

CORN SAW-FLY (*Cephus pygmæus*). An insect the larvæ of which prey upon the wheat and other cereals. The female deposits her eggs in the stalk, where the larvæ live upon the interior of the straw and the nutritive juices of the plant.

CORN-THRIPS. A minute species of thrips, the *Thrips cerealium*, which does much mischief to grain crops, insinuating itself between the chaff and the unripe seed, and causing the latter to shrivel by sucking the juice. It is barely a line long.

CORNU COPIÆ ("horn of plenty"). A wreathed horn filled to overflowing with fruit, flowers, and grain; used as the symbol of plenty. Also written *Cornucopia*.—Cf. Horace, *Carmen Sæculare*, line 60.

CORNUS. *See* CORNACEÆ.

CORN'WALL. A maritime country of England, forming the south-western extremity of the island, bounded east by Devonshire, and surrounded on all other sides by the sea; area, 868,167 acres.

Physical Features.—The coast-line is much broken. Mount's Bay, Falmouth Bay and Harbour, Whitesand Bay, Fowey Harbour, and St. Austell Bay are the principal openings on the south coast. The indentations on the north consist of shallow bays with few or no harbours. Between these two coasts is the promontory of Land's End, terminating in granite cliffs about 60 feet high. Some of the other cliffs exceed 400 feet in height. At Land's End terminate the hills of the Devonian Range. The part of this range belonging to Cornwall stretches from north-east to south-west, form-

ing the principal watershed of the county. Its highest summit is Brown Willy, 1368 feet. Granite and old red sandstone are the chief rocks. The rivers are numerous but short. Much of the area, especially in the elevated districts, is barren moorland. About a fifth is under the plough.

Minerals.—The chief wealth of the county is in its minerals, especially its mines of copper and tin, though the value of both has greatly sunk. Several mines exceed 350 fathoms in depth. In the Botallack Copper Mine, a few miles north of Land's End, the workings are carried below the sea. Besides tin and copper, silver, lead, zinc, iron, manganese, antimony, cobalt, and bismuth are found in comparatively small quantities. There are also valuable deposits of kaolin or china-clay.

There are no manufactures, but the fisheries, particularly of pilchard and mackerel, are valuable. Cornwall, with the Scilly Isles, is considered by some authorities to have been the Cassiterides or Tin Islands of antiquity. The natives long maintained their independence against the Saxons, and their country was spoken of as West Wales. Their language also long continued to be Celtic.

The chief towns are Bodmin (county town), Penzance, Truro, and Falmouth (with Penryn). Cornwall has five political divisions, each sending a member to Parliament. It gives the title Duke of Cornwall to the eldest son of the sovereign of Great Britain, and forms a royal duchy, the revenues of which (£240,000) belong to the Prince of Wales for the time being. The annual payment to his private account is about £60,000. Pop. (1931), 317,951.

CORNWALL. A port and manufacturing town of Canada, province of Ontario, on the north side of the St. Lawrence, 67 miles above Montreal. Pop. 11,126.

CORNWALL, Duke of. Title borne by the Prince of Wales. It is given to him when he is made prince, and with it he becomes the owner of large estates in Cornwall, Devon, and London. The estates include tin mines and property on and near Dartmoor. The London property is in Kennington and Lambeth. The estates are managed by a council of which the prince is president. In 1926 the revenue amounted to £246,000. The first duke, Edward, the Black Prince, was created in 1337. As duke the Prince appoints the high sheriff of Cornwall.

CORN'WALLIS, Charles, Marquess. Son of the first Earl Cornwallis, born in 1738. Educated at Eton and at Turin, he served in 1761 as an aide-de-camp in the Seven Years' War; was made colonel of foot in 1766, and finally general. On the outbreak of the American War he sailed with his regiment, served with distinction under Howe and Clinton, and in 1780 was left in independent command in South Carolina with 1000 men. He defeated General Gates at Camden in 1780, and General Green at Guildford in 1781, but six months afterwards was besieged in Yorktown and compelled to surrender on 19th Oct., 1781. This disaster proved decisive to the result of the war.

In 1786 Lord Cornwallis went out to India as commander-in-chief and Governor-General, invaded Mysore in 1791, and obliged Tippoo Sahib to surrender much territory. He was created a marquess in 1792. He suppressed the Irish rebellion of 1798, negotiated the peace of Amiens (1802), again became Governor-General of India (1804), and died at Ghazipur in 1805.

CORNWALL'S LIGHT INFANTRY, Duke of, The. Raised as marines in 1701; fought in the War of the Spanish Succession; captured, and later defended Gibraltar; and served in the Peninsula with consummate valour under Picton. It gained fresh honours at Lucknow, and in Egypt and South Africa (1899-1902), and in the European War was distinguished at Le Cateau, La Bassée, and upon the Aisne.

CORN-WEEVIL. A destructive insect which preys upon stored corn. There are various species: ord. Coleoptera, family Curculionidæ, genus Calandra. The *Calandra granaria* is a slender beetle of a dark-chestnut colour about one-eighth of an inch long. It bores a hole and deposits its egg inside of the grain, which is afterwards eaten to a husk by the grub. The closely related *C. oryzæ* attacks stored rice.

CORO. A seaport town, Venezuela, capital of the state of Falcón, at one time a flourishing place but now of less importance. Pop. 15,533.

COR'OCORE. A boat of the Indian Archipelago of various forms. That used in Celebes is propelled by oars, and is often manned by sixty men. Others, as those used in the Moluccas, are masted vessels.

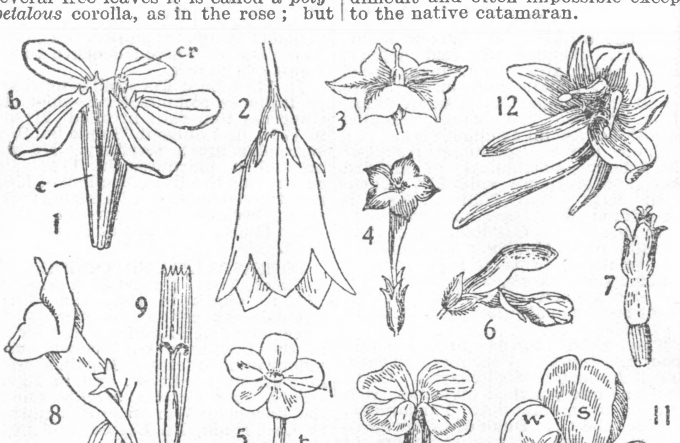
COR'ODY, or CORR'ODY. An allowance of meat, drink, or clothing, anciently due to the king from an abbey or other religious house, for the sustenance of such of his servants

as he thought good to place there for maintenance. Corodies were also retained by the private founders of religious houses and even granted to benefactors, and consisted in the right of sending a certain number of persons to be boarded at an abbey.

COROL'LA. In botany, the portion of the flower immediately inside the calyx; the inner floral envelope. The corolla surrounds the parts of fructification and is composed of leaves called petals. When there are several free leaves it is called a *polypetalous* corolla, as in the rose; but

tinguished by the corolla being gamopetalous, inserted generally below the ovary, and by the stamens being inserted on the corolla. The primrose, heath, gentian, verbena, etc., are included in this division.

COROMAN'DEL COAST (*Cholomandala*). The east coast of the Indian Peninsula, Madras Presidency, or that portion of it between Palk's Strait and the River Pennar. It is open, sandy, and has no secure harbours, and the surf renders landing difficult and often impossible except to the native catamaran.



Types of Corollas

1, Polypetalous, as in order Caryophyllaceæ (*b*, blade; *c*, claw; *cr*, crown or corona). 2, Gamopetalous. and Campanulate. 3, Rotate. 4, Funnel-shaped. 5, Salver-shaped (*l*, limb; *t*, tube). 6, Labiate. 7, Tubular, as in Compositæ; 8, Personate and spurred at base. 9, Ligulate or strap-shaped, as in Compositæ. 10, Cruciform. 11, Papilionaceous (*s*, standard; *w*, wings; *k*, keel). 12, An orchid.

when the petals are united by the margins into a continuous structure it is called *monopetalous*, or more correctly *gamopetalous*. It may generally be distinguished from the calyx by the fineness of its texture and the gayness of its colours; but there are many exceptions. The chief function of the corolla is to attract, by its bright coloration, the insects or other animals that effect cross-pollination; sometimes it serves also for pollen protection, or secretes nectar, and rarely is useful in connection with fruit-dispersal.

COROLLIFLO'RÆ. In Bentham's and Hooker's system, one of the great subdivisions of dicotyledons, dis-

COROMANDEL WOOD. The wood of *Diospyros quæsita*, a tree found in Ceylon. Its ground colour is chocolate-brown, with black stripes and marks; it is hard, turns well, and makes very handsome furniture.

CORO'NA (Lat., "a crown"). (1) In astronomy and meteorology, a luminous circle round one of the heavenly bodies; in astronomy, specifically the portion of the aureola observed during total eclipses of the sun, which lies outside the chromosphere or region of coloured prominences. (*See* ECLIPSE.) (2) In botany, an appendage of the corolla in some flowers, coming as it were between the corolla and the stamens,

well seen in the cup of the daffodil. (3) In architecture, the lower member of the projecting part of a cornice.

CORO'NA AUSTRA'LIS (the "southern crown"). One of Ptolemy's southern constellations, also known as Corolla, or the Wreath. It is barely visible in British latitudes.

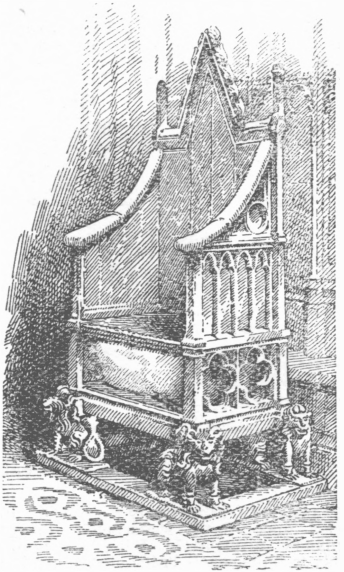
CORO'NA BOREA'LIS (the "northern crown"). One of Ptolemy's northern constellations, containing a fine semicircle of stars. A *nova*, or temporary star, appeared in the constellation in 1866.

COR'ONACH, or **CORANACH.** A dirge or lamentation for the dead formerly customary amongst the Celts of Scotland and Ireland. The usual term in Ireland is *keening*.

CORONA'TION. The placing of the crown on a monarch's head with solemn rites and ceremonies. Part of the ceremony usually consists in the oath which the monarch takes, that he will govern justly, will always consult the real welfare of his people, and will conscientiously observe the fundamental laws of the State. In England kings have been anointed and crowned in Westminster Abbey, even to the latest times, with great splendour.

Coronation Oath.—The form of the *coronation oath* is that settled after the revolution of 1688. Special clauses, repugnant to Roman Catholics, were here added, but the oath was altered by an Act of Parliament in 1910. The objectionable phrases relating to the Catholic religion were omitted from the coronation oath of King George V. The Archbishop of Canterbury puts it to the sovereign, who swears to govern according to the statutes of Parliament, to cause law and justice in mercy to be executed, and to maintain the Protestant religion.—BIBLIOGRAPHY: L. G. W. Legg, *English Coronation Records*; C. E. Pascoe, *The Pageant and Ceremony of the Coronation of their Majesties King Edward the Seventh and Queen Alexandra.*

CORONATION CHAIR. An ancient chair kept in Westminster Abbey, and used at the coronation of the sovereigns of England, all of whom have been crowned in it since Edward I. It is said to have been made for that king, and is architectural in design, having a high, upright, gabled, and crocketed back, with panels of tracery work, and rests on four carved lions. In a space beneath the seat is the famous *Coronation Stone*, the Scottish *Lia Fail* or "Stone of Destiny," carried off to England by Edward I. The Scots had previously, according to the legend, carried it off from Ireland, where it was used in the coronation of Irish kings at Tara. Monkish authorities also state that the stone was originally Jacob's pillow; but it bears a suspicious resemblance to the red sandstone of some rocks near Scone, where it was used in the coronation of Scottish kings. There is also a coronation chair for the queen consort, made for the coronation of Mary II., when crowned along with William III.



Coronation Chair and Stone, Westminster Abbey

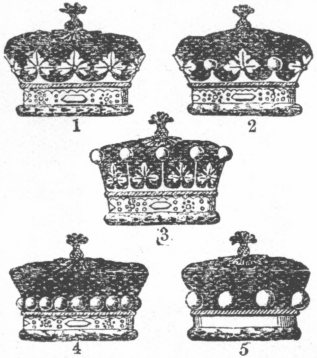
CORONEL'LA. A widely distributed genus of non-poisonous snakes, e.g. the British smooth snake.

CORONER. An official in England whose chief duty is to inquire into the cause of the death of persons killed or dying suddenly. The office of coroner has existed for a very long time, although there is doubt whether it really was in existence in the reign of Alfred. There are several coroners for each county, and one for every borough having separate quarter sessions and at least 10,000 inhabitants, the coroner being appointed for life by the town or county council.

Since the Coroners (Amendment) Act, 1926, it is no longer necessary for the jury to view the body, and a jury may be dispensed with in some cases. If the jury have brought in

a verdict of murder or manslaughter the coroner must issue a warrant to arrest and detain the person charged, but in the case of manslaughter may admit him to bail. In the British colonies and the United States there are also coroners, but not in Scotland, where the duties are performed by an officer called a procurator-fiscal.—Cf. R. H. Wellington, *The King's Coroner* (2 vols.).

COR'ONET. A variety of crown such as is worn by princes and noblemen. The coronet of a British duke is set round with eight strawberry leaves; that of a marquess has four strawberry leaves and four silver balls



1, Coronet of a duke. 2, Coronet of a marquess.
3, Coronet of an earl. 4, Coronet of a viscount.
5, Coronet of a baron.

(" pearls ") alternately; that of an earl has eight strawberry leaves placed alternately with as many silver balls, each ball being mounted on a pyramidical point or ray; that of a viscount is surmounted by sixteen silver balls; that of a baron has six silver balls. *See* CROWN.

CORONIUM. The spectrum of the sun's corona contains several bright lines, notably a brilliant green one, unknown in terrestrial spectroscopy. The element producing it, designated " coronium," is supposed to have an atom of simpler structure than any known chemical element.

COROT (kō-rō), **Jean-Baptiste-Camille.** French artist, born at Paris in 1796, died in 1875. He studied under Michallon and Victor Bertin and afterwards in Italy, and exhibited for the first time in the Salon in 1827, but some years elapsed before the high qualities of his work were recognized. The fortune which he inherited from his father enabled him, however, to follow out the bent of his genius, and the last twenty-five years of his life were a continuous triumph. He frequently painted figure subjects, including the sacred picture *The Flight into Egypt*; but his most characteristic and successful work was in landscape. His *Macbeth* is in the Wallace collection, and *Pastorale—Souvenir d'Italie* in the Glasgow Corporation Art Gallery.

His woodland scenes, painted for the most part at dawn or twilight in a scheme of pale-greens and silvery-greys, show a singularly subtle feeling for this phase of nature, and are among the most important contributions of the century to landscape art. Few artists have been so successful in painting light and air, or in infusing work manifestly closely studied from nature with an ideal charm. His defect is one of limitation in range, but within this limit he has no rival.—BIBLIOGRAPHY: A. Robaut, *L'Œuvre de Corot* (4 vols.); Muther, *History of Modern Painting*; G. Moore, *Ingres and Corot in Modern Painting*; E. Birnstigl, *Corot.*

CORO'ZO-NUTS. The seeds of a tropical American palm, the *Phytelephas macrocarpa*, whose hardened albumen, under the name of vegetable ivory, is used for small articles of turnery-ware.

COR'PORAL (Fr. *caporal*, from Lat. *caput*, the head, the corporal being formerly a superior officer). In the British army, as also in that of America, a non-commissioned officer ranking above the ordinary private and below the sergeant. He has charge of one of the sections of the company, places and relieves sentries, etc.—**Lance-corporal** is an appointment, not a rank. He performs some of the duties, but does not receive the pay, of a corporal.

CORPORAL (Lat. *corporale*, from *corpus*, body). The white linen cloth spread on the altar during the celebration of the eucharist in the Roman Catholic and Anglican Churches.

CORPORA'TION. In law, a civil or political body in which are vested certain rights or privileges with a view to their preservation in perpetual succession. A corporation may consist of one person only and his successors, when it is called *sole* (the sovereign of Britain for example); or of a number of persons, when it is called *aggregate*. When a corporation is vested in a single person, that person is looked upon in regard to the rights of the corporation as holding a representative or official position, and these rights belong to and are transmitted by him in virtue of this position, and not as natural rights. In like manner the rights and powers

of an aggregate corporation do not consist of the natural rights of the members, but of the rights held and duly exercised by the terms of the corporation.

The legal divisions of corporations in England are into *spiritual*, intended to perpetuate the rights of the Church; and *lay*, instituted for temporal purposes. The latter include municipal corporations, or the corporations of municipal boroughs, universities, corporations established for the administration of charitable funds, as hospitals, colleges in universities, etc. Corporations are created either by a charter from the sovereign, by Act of Parliament, or by prescription. Joint-stock companies are a species of corporation.—BIBLIOGRAPHY: F. Hendrick, *Power to Regulate Corporations and Commerce*; T. E. Burton, *Corporations and the State*; Purdy, *Treatise on the Law of Private Corporations*.

CORPORATION AND TEST ACTS. Two Acts of note in English history. The Corporation Act, passed in 1661, prevented any person from being legally elected to any office belonging to the government of any city or corporation in England, unless he had, within the twelvemonth preceding, received the sacrament of the Lord's Supper according to the rites of the Church of England. The Test Act, passed in 1673, required all officers, civil and military, to take the oaths, and subscribe a declaration against transubstantiation, in the courts of King's Bench or Chancery, within six months after their admission; and also within the same time to receive the sacrament of the Lord's Supper according to the usage of the Church of England in some public church. The Corporation Act was principally directed against Protestant Nonconformists; the Test Act against Roman Catholics. In the year 1828 they were both repealed.

CORPORATION DUTY. A tax levied in Great Britain on the property of corporations, which, as they never die, cannot pay death duties.

CORPORATION PROFITS TAX. Imposed by Finance Act, 1920, is a duty of 5 per cent. on the profits of British companies carrying on any trade or business, or any undertaking of a similar character, including the holding of investments, and of foreign companies carrying on in the United Kingdom any trade or business, or any undertaking of a similar character, so far as these profits arise in the United Kingdom; provided, however, that (1) only profits arising after 31st Dec., 1919, fall into charge; (2) the first £500 of annual profits are exempted; and (3) British companies are not liable in a greater sum than 10 per cent. of the balance of profits in any accounting period, after deducting interest or dividends paid therefrom at a fixed rate on any debentures, debenture stock, preference shares, or permanent loan issued before the commencement of the Act, or on any debentures, etc., issued after that date to replace an equal amount issued before that date.

Until 31st Dec., 1922, exemption is granted to building societies and to gas, water, electricity, tramway, hydraulic power, dock, canal, and railway undertakings operating wholly in the United Kingdom, and precluded by statute from charging more than a stated price or distributing more than a stated dividend. Subject as above mentioned, the profits chargeable are the actual profits arising in the accounting period of twelve months ending on the date up to which the accounts of the company are usually made out, such profits including income from investments, trade premises, etc., and any income-tax and corporation profits tax paid during the period, but deductions are allowed in respect of interest on borrowed money (except permanent loans and except where the lender holds a controlling interest), rent, share of profits distributed to employees under a profit-sharing scheme, Excess Profits Duty payable in the United Kingdom or abroad for the period, and Excess Profits Duty repaid during the period. The official responsible for the due disclosure of liability is in the case of a British company the secretary. This tax was terminated by the Finance Act, 1924, Section 24.

CORPS (kōr; French for body). A word often used as a military and a political term.—**A corps d'armée**, or **army corps**, one of the largest divisions of an army.—**Corps diplomatique**, the body of ministers or diplomatic characters.—**Corps législatif** (kōr lā-zhis-lā-tēf), the lower house of the French legislature from 1857 to 1870. Its members were elected for six years in the proportion of 1 to 35,000 electors. —The word is also applied to any organized body, as in **corps de ballet**.

CORPULENCE, or OBESITY. A disorder of metabolism characterized by an excessive deposit of fat in the body. This results primarily from the inadequate oxidation of the food-stuffs. It is not always due to excessive consumption of food, but in many cases this is the direct cause of the increase in weight. There is a marked hereditary tendency, and certain races are prone to obesity, while on the whole women are more affected than men.

Shortness of breath, embarrassed heart-action, and difficulty in walking are among the chief inconveniences attending sufferers from obesity.

When the tendency to corpulence is hereditary, not much can be hoped for from treatment; but in other cases diet can do much to reduce the excess of fat. The chief points to be observed are the avoidance of taking too much food, the reduction of the starches and fats, and the absence of sweet foods in the diet. Systematic exercise should be encouraged. There is a definite relationship between the body weight and the glands of internal secretion; hence it has been found that the administration of thyroid and pituitary gland-extracts is frequently successful in cases of obesity.

CORPUS CHRISTI ("body of Christ"). The consecrated host at the Lord's Supper, which, according to the doctrines of the Roman Catholic Church, is changed by the act of consecration into the real body of Christ. This doctrine caused the adoration of the consecrated host, and hence the Roman Catholic Church has ordained for the host a particular festival, called the *Corpus Christi feast*. This was instituted in 1264 by Pope Urban IV. by a bull (*Transiturus*), in which he appointed the Thursday of the week after Pentecost for the celebration of the Corpus Christi festival throughout Christendom. Since then this festival has been kept as one of the greatest of the Catholic Church. Splendid processions, in which the host is carried by a priest in a precious box, form an essential part of it. It was introduced from Belgium into England between 1320 and 1325. In France it is known as the *Fête-Dieu*.

CORPUS CHRISTI COLLEGE (Cambridge). Called also **Benet College**, was founded about 1352 by the united guilds of Corpus Christi and the Blessed Virgin, two fraternities of townspeople which used to meet for prayers at St. Benedict Church and St. Mary's respectively. The endowments of the college were considerably increased by Archbishop Parker, who also bequeathed to it his valuable collection of manuscripts.

CORPUS CHRISTI COLLEGE (Oxford). A college founded by Richard Fox, Bishop of Winchester, under the licence from Henry VIII. in 1516. The foundation consisted of twenty fellows and twenty scholars.

CORPUS'CULAR THEORY OF LIGHT. The older theory, which explained the phenomena of light by supposing that a luminous body emits excessively minute particles of matter, corpuscles as they were called, which striking the eye produce the sensation of light. Newton held the corpuscular theory, and supported it with great ingenuity. It has long been displaced by the *undulatory theory*; but the recent discoveries of the atomic nature of electricity, and even, in a sense, of radiation, are tending to revive interest in the old theory and its possibilities. *See* ELECTRON; ETHER; LIGHT; MATTER; QUANTUM THEORY; RADIATION.

CORPUS JURIS ("body of law"). A name given to certain collections of laws. The name of *Corpus Juris Civilis* ("body of civil law") in particular was bestowed in the twelfth century upon the general body of legal works drawn up at the orders of Justinian, viz. the *Institutes*, *Pandects*, *Code*, and *Novels*, together with the collections bearing on the feudal law appended to them. With the canonical or Papal laws the same mode of proceeding has been adopted, and the *Corpus Juris Canonici* compiled.

CORRECTION OF THE PRESS. The correction of printed matter before publication. The first impression taken from the types is called a *proof*, and almost always contains some errors. In correcting proofs for the printer the following signs are used:

When a wrong word or letter occurs, a line is drawn through it, and the proper word or letter written in the margin opposite.

If a clause, word, or letter is omitted, a caret (^) is marked at the place, and the omission is written in the margin.

If a superfluous letter or word occurs, the pen is drawn through it, and the character ⅁ (signifying delete, or take out), written in the margin.

Where words are improperly joined, a caret is written at the place where the separation should be made, and the mark ⧺ written in the margin.

When syllables or words are improperly separated, they are joined by horizontal parentheses, as du ty. These parentheses are to be made in the margin as well as at the break.

When words are transposed, they are to be connected by a curved line, as "not is" when set up in error for "is not," and the abbreviation *tr.* (transpose) is to be written in the margin.

When a letter is turned, a line is drawn under it, and the mark ⅁ made in the margin.

When punctuation is omitted, or requires to be altered, a caret is put at the place, and the comma or period,

etc., is placed in the margin, with a stroke behind it, as ,/

If a mark of quotation or superior letter has been omitted, the caret is made as before, and a mark of this sort ✓, ✓, or ✓, placed in the margin.

An inferior figure or letter is indicated thus, z_7^7.

Words which are to be printed in italics are marked beneath with a single line, as office (*office*); if in small capitals, with two lines, as Greece (GREECE); if in full capitals, with three, as James (JAMES); if in black type, with a waved line, as Rome (**Rome**). Where these marks are used in correction, the abbreviations *ital.*, *small caps.*, *caps.*, or *black* should be written in the margin.

Where a word printed in italics is to be altered to roman letters, a line is to be drawn under it, and the abbreviation *rom.* written in the margin.

Where a corrector, after altering a word, changes his mind, and prefers to let it stand, dots are placed under the word in the proof, and the word *stet* (let it stand) written in the margin.

When two paragraphs are desired to be joined, the end of the one and the beginning of the other paragraph are connected by a curved line ⁀, and the words *run on* written in the margin.

Where a new paragraph is desired to be made, the mark [is inserted at the place, and the abbreviation *par.* or *N.P.* written in the margin.

The corrections should always be written in the margin of the proof, so as to ensure notice by the printer; and when these are numerous or intricate, it is advisable to connect them by a line drawn from the place where they are to be made.

CORREGGIO (kor-rej'ō), **Antonio Allegri.** Italian painter, born at Correggio, near Modena, in 1494, died in 1534. Little is known of his life, which was very retired. Almost the only anecdote told of him is that on seeing the *St. Cecilia* of Raphael he exclaimed "Anch'io sono pittore" (I also am a painter); but this is doubtful. Correggio is unrivalled in chiaroscuro and in the grace and rounding of his figures. Among his best pictures are: *Night*, in which the chief light is the glory beaming from the infant Saviour; *St. Jerome*; *The Marriage of St. Catherine*; several Madonnas, one of them (called *La Zingarella*, or *The Gipsy Girl*) said to represent his wife, Girolama Merlino, whom he married in 1520; *The Penitent Magdalene*; the altarpieces of *St. Francis*, *St. George*, and *St. Sebastian*; *Christ in the Garden of Olives*; the fresco of *The Ascension* in the church of St. John, Parma; *The Assumption of the Virgin* in the cathedral of the same city; the *Ecce Homo*, and *Cupid, Mercury, and Venus*, both in the National Gallery, London.—BIBLIOGRAPHY: C. Ricci, *Life and Times of Correggio*; T. S. Moore, *Correggio.*

CORRÈZE (kor-rāz). An inland department, France, formed from part of the former province of Limousin, and deriving its name from the River Corrèze, by which it is traversed; area, 2272 sq. miles; capital, Tulle. It belongs almost entirely to the basin of the Garonne. Except in a few valleys the soil is far from fertile, heaths occupying a great extent of surface, and agriculture being in a very backward state. Pop. (1931), 364,129.

CORRIB, Lough. A large lake in Ireland, mostly in County Galway, partly also in County Mayo, about 23 miles in length, and varying from 2 to 6 miles in breadth. It receives the drainage of Lough Mask through a subterranean channel, its own waters being carried by Galway River to Galway Bay. It has some fine scenery on its northern and western shores, contains numerous islands, and, next to Lough Neagh, is the largest lake in Ireland.

CORRIEN'TES. A town, Argentine Republic, capital of the province of same name, on the Paraná, near its confluence with the Paraguay, 390 miles N. of Buenos Aires. It is well placed to serve as an entrepôt of goods, between the upper parts of the Paraguay, and the Paraná, and the seaports on the La Plata. Pop. 28,681. Area of province, 33,535 sq. miles; pop. (1931), 439,543.

COR'ROBOREE. A dance amongst Australian natives in which the performers, with shields in their hands, circle round a fire. The men usually do the dancing, whilst the women furnish the music. The dance, which, to some extent, is a national institution among these primitive people, serves also as a peace ratification.

CORRODY. *See* CORODY.

CORRO'SIVES (Lat. *corrodere*, to eat away). In surgery, substances which eat away whatever part of the body they are applied to; such as glacial acetic acid, burnt alum, white precipitate of mercury, red precipitate of mercury, and butter of antimony.

CORROSIVE SUBLIMATE, or **MERCURIC CHLORIDE** ($HgCl_2$). A white crystalline solid, an acrid poison of great virulence. The stomach-pump and emetics are the surest preventives of its deleterious effects when accidentally swallowed; white of egg is also serviceable in counteracting its poisonous influence on the stomach. Its dilute solution is one of the most powerful antiseptics. It is also used for the purpose of preserving museum specimens.

COR'RUGATED IRON. Sheet-iron strengthened by being bent into parallel furrows. It is largely used for roofing, and when dipped in melted zinc, to give it a thin coating, is commonly known as *galvanized iron.*

CORRYVRECK'AN. A place on the west coast of Scotland, between the Islands of Jura and Scarba, where at certain times of the tide, and in high winds, the water forms a sort of whirlpool that is dangerous for small vessels.

CORSAC, or **CORSAK** (*Canis corsac*). A species of yellowish fox or dog found in Central Asia, Siberia, and India. It is gregarious, prowls by day, burrows, and lives on birds and eggs.

CORSAIR. Name applied to the Barbary pirates. They inhabited the north coast of Africa, and made frequent raids on the European shores and Mediterranean shipping.

COR'SICA (Fr. *Corse*). An island in the Mediterranean, forming the French department of same name. It is separated from the Island of Sardinia, on the south, by the Strait of Bonifacio, about 10 miles wide; length, N. to S., 110 miles; breadth, near its centre, 53 miles; area, 3367 sq. miles.

Physical Features.—The east coast is almost unbroken, but on the west coast a number of deep bays, St. Fiorenzo, Calvi, Porto, Liscia, Ajaccio and Valinco, follow in rapid succession. The interior is traversed by a mountain chain, the culminating point of which, according to the latest surveys, is Monte Cinto, 8881 feet high, Monte Rotondo coming next with 8612 feet. From the east and west sides of the chain numerous streams flow to opposite sides of the coast, generally mere torrents.

With the exception of some marshy districts on the east coast, the climate is very fine. There are large forests containing pines, oaks, beeches, chestnuts, and cork trees, and the mountain scenery is splendid. In the plains and numerous valleys the soil is generally fertile; but agriculture is in a backward state. Mules, goats, horses, cattle, and sheep, and amongst wild animals the boar, the fox, and the deer, are common. There are good fisheries. In minerals Corsica is not rich. The chief exports are wine, brandy, olive oil, chestnuts, fruit, and fish. The chief towns, Ajaccio and Bastia, are connected by railway.

History.—The island was first colonized by the Phœnicians, from whom it got the name of Cyrnos. The Romans afterwards gave it that of Corsica. From the Romans it passed to the Goths, and from them to the Saracens, and in the fifteenth century to the Genoese. France had the rights of the Genoese ceded to her, after Paoli had virtually made Corsica independent, and entered on forcible possession of it in 1768. An insurrection in 1794, headed by General Paoli and assisted by the British, for a time restored the island to independence; but in 1796 it again fell under the dominion of France. It was again occupied by Great Britain in 1814, but restored to France in 1815. The most distinguished men to whom Corsica has given birth are Paoli and Napoleon. Pop. (1931), 297,235. — BIBLIOGRAPHY: James Boswell, *An Account of Corsica* (1768); L. H. Caird, *History of Corsica*; R. le Joindre, *La Corse et les Corses*; J. M. Chapman, *Corsica: an Island of Rest.*

CORSNED (A.Sax.). Formerly a piece of bread consecrated by exorcism, to be swallowed by any person suspected of a crime. If guilty, it was expected that the swallower would fall into convulsions, or turn deadly pale, and that the bread would find no passage. If innocent, it was believed the morsel would turn to nourishment. Godwin, Earl of Kent, is supposed to have met his fate in this way, when he was accused of the death of the king's (Edward the Confessor) brother. The ordeal by bread and cheese was practised in Alexandria about the second century.

CORT, Henry. The inventor of the processes of puddling and rolling iron, born at Lancaster in 1740, died in 1800. He commenced business at Gosport, Hampshire; erected ironworks, and studied with great success methods of improving the process of manufacturing iron. By the unfortunate selection of a partner he was involved in a complication of lawsuits, and finally ruined. In 1794, however, he received a pension of £200 a year from Government.

CORTES (kor'tes). The old assembly of the estates in Spain and

Portugal. In early times the king was very dependent upon them, especially in the Kingdom of Aragon. When the Kingdoms of Aragon and Castile were united under Ferdinand and Isabella, the Crown succeeded in rendering itself more independent of the estates, and in 1538 Charles abolished the assembly of the estates in Castile altogether. Gradually the popular liberties were encroached upon, and the Cortes at length were convened only for the purpose of homage or ceremony, or when a question regarding the succession arose.

In 1808 Napoleon revived the Cortes for his own ends. The present Cortes of Spain are composed of a Senate and Congress equal in authority, and having the power along with the king to make laws. The present Cortes of Portugal consist, since the revolution of 1910, of a National Council (164 members) and a Second Chamber (71 members).

COR'TEZ, or **CORTES, Hernando** (sometimes spelt **Fernando**) or **Hernan.** The conqueror of Mexico, was born in 1485 at Medellin, in Estremadura, died near Seville 1547. He went to the West Indies in 1504, where Velasquez, Governor of Cuba, under whom he had greatly distinguished himself, gave him the command of a fleet, which was sent on a voyage of discovery. Cortez quitted Santiago de Cuba in 1518, with 11 vessels, about 700 Spaniards, 18 horses, and 10 small field-pieces. He landed on the shore of the Gulf of Mexico, where he caused his vessels to be burned, in order that his soldiers might have no other resource than their own valour. Having induced the Totonacs and Tlaxcalans to become his allies, he marched towards Mexico, where he was amicably received; but, having seized their monarch Montezuma, and treated the people with great cruelty, they finally resisted. After a desperate struggle, in which 100,000 Mexicans are said to have perished, the city was taken, and soon after the whole country was subjugated.

In 1528 he returned to Spain; but two years after he was again sent out to Mexico, where he remained for ten years, discovering meanwhile the Peninsula of California. He returned once more to Spain, where, notwithstanding his great services, he was coldly received and neglected. After taking part in an expedition to Algiers in 1541, he passed the remainder of his days in solitude. Cortez left a character eminent for bravery and ability, but infamous for perfidy and cruelty. His letters addressed to Charles V. have been translated into English and edited by F. A. MacNutt in 1908.—BIBLIOGRAPHY: W. H. Prescott, *History of the Conquest of Mexico*; Sir Arthur Helps, *Life of Hernando Cortes*; F. A. MacNutt, *Fernando Cortes* (Heroes of the Nations Series).

CORTO'NA, Pietro da (properly **Pietro Berrettini**). A painter and architect, was born at Cortona in 1596, died 1669. Pope Urban VIII. employed him to decorate a chapel in the church of St. Bibiena, and also to execute the frescoes of the grand salon of the Barberini Palace. Many churches of Rome were decorated by him; and at Florence he adorned the Pitti Palace for the Grand-Duke Ferdinand II. His easel pictures, although of less value than his larger works, are held in great estimation. As an architect he did some important work in church restoration.

CORTO'NA. A town of Italy, 69 miles S.E. of Florence, with a fine cathedral and interesting Etruscan and Roman remains. Pop. 29,750.

CORUNDUM. Mineral aluminium oxide (alumina), crystallizing in the trigonal system in tapering bipyramidal forms, which are often rough on the surface and assume ellipsoidal shapes. Its hardness is between that of topaz and diamond. Its colour is commonly greyish, verging on blue, or brownish red. When free from impurities and transparent, the blue variety is the valuable gem *sapphire*, and the red is the true *ruby*. Emery is corundum (largely sapphire) in a comminuted state, forming, with magnetite and other impurities, a kind of sandstone. Corundum commonly occurs in granite as the result of the absorption of aluminous rocks by the mass when in a molten state; also in altered limestone and various metamorphic rocks. The gem-forms are in places gathered from alluvial deposits, where they accumulate owing to the high specific gravity of the mineral (4·0).

CORUN'NA (Sp. *Coruña*). A seaport of Spain, in the province of the same name in Galicia, on the northwest coast, on a peninsula at the entrance of the Bay of Betanzos. It consists of an upper and a lower town, the former built on the east side of a small peninsula, and the latter on the isthmus connecting the peninsula with the mainland. The harbour, which is well protected, is deep, spacious, and safe. There is a Government cigar factory employing several thousands of women and

girls; glass and cotton goods are also made. There is a lighthouse, 92 feet high, called the Tower of Hercules, which was restored under Trajan. Corunna was the port of departure of the Spanish Armada (1588), and the scene of the repulse of the French and the death of Sir John Moore (1809). Pop. 67,681.—The province is hilly, and its inhabitants chiefly engaged in agriculture and fishing. Area, 3051 sq. miles; pop. (1930), 733,766.

CORVÉE (kor'vā). In feudal law, an obligation on the inhabitants of a district to perform certain services, as the repair of roads, for the sovereign or the feudal lord. In France this system was not finally abolished until 1792. In Egypt the corvée was gradually abolished between 1888 and 1891, but the construction of the Suez Canal during its early stages was carried out under the system of corvée, or forced labour. Taxes of the nature of corvée are now obsolete in most countries, although conscription may be regarded as an exception to this rule.

COR'VETTE. A vessel of war, ship-rigged, having a flush deck, with no quarter-deck and only one tier of guns; but the term is now superseded by *cruiser*. In the British navy there was a class of corvettes built of iron or steel, swift vessels, propelled by steam as well as by a large spread of canvas, and carrying heavy guns.

COR'VEY, or **KORVEI** (kor'vī). A formerly renowned Benedictine abbey, near Höxter, in the Prussian province of Westphalia, founded in 816, an early centre of German civilization. Wittekind, the historiographer of the convent, Bruno, known afterwards as Pope Gregory IV., and many other learned men, were educated here. To its library belonged the only MS. of the first six books of the *Annals* of Tacitus, discovered here in 1514. The abbey, or castle of Corvey, as it is now called, has a rich and extensive library; but the ancient collection of the Benedictines is no longer in existence.

COR'VIDÆ. The crows, a family of passerine birds, in which the bill is strong, of conical shape, more or less compressed, and the gape straight. The nostrils are covered with stiff bristle-like feathers directed forwards. The family includes the common crow, rook, raven, magpie, jay, jackdaw, nut-cracker, and Cornish chough.

CORVI'NUS, Matthias. King of Hungary, second son of John Hunniades. The enemies of his father kept him imprisoned in Bohemia, but in 1458, at the age of sixteen years, he was called to the throne of Hungary. He maintained his position against Frederick III., repelled the invading Turks, and between 1468 and 1478 conquered Silesia, Moravia, and Lusatia; he was also victorious over the Poles, and took the greater part of Austria, including Vienna, from Frederick, and held all his extensive conquests till his death. He encouraged science and scholarship, and collected a great library (afterwards destroyed by the Turks) at Buda. He died in 1490.

CORVUS, M. Valerius. Famous general of the early Roman Republic, born about 370 B.C., died about 270 B.C. He was elected Consul in 348; defeated the Volsci, the Samnites, the Etruscans, and the Marsi; was Dictator in 342 and in 301; Consul for the sixth time in 299.

COR'YATE, Thomas. An eccentric English traveller, born in 1577, died at Surat, India, 1617. His wanderings, a great part on foot, were through Europe, Asia Minor, Persia, and India. His travels were published under such curious titles as *Coryate's Crudities*, and *Coryate's Crambe or Coleworte twice sodden*. He acted as a sort of butt or foil to the wits with whom he associated in London.

CORYLUS. *See* HAZEL.

COR'YMB. In botany, that form of inflorescence in which the flowers, each on its own pedicel of different lengths, are so arranged along a common axis as to form a flat, broad mass of flowers with a convex or

Corymb

level top, as in the hawthorn and candytuft. *See* INFLORESCENCE.

COR'YPHA. A genus of palms, including the fan-palm, gebang-palm, and taliput.

CORYPHÆ'NA, or **COR'YPHENE.** A genus of bony fishes belonging to the family Coryphænidæ. The body is elongated, compressed, and covered with small scales, and the dorsal fin extends the whole length of the back, or nearly so. The dolphin of the ancients is the *C. hippūrus*. All the species, natives of the seas of warm climates, are very rapid in their motions, and very voracious.

CORYPHÆ'US. The leader of the chorus in the Greek dramas. His functions were often as wide as those of our stage-manager, conductor, and ballet-master. The name *coryphée* is now applied to a ballet-dancer.

CORYPHODON. A genus of extinct Eocene Ungulata, embraced in the family Amblypoda. The included species were stoutly built, small-brained animals, with five blunt toes on each foot, and a slender tail. The molar teeth possessed broad ridged crowns, and there were well-developed tusks in the upper jaw.

COS (now called **STANCHIO,** or **STANKO**). An island in the Ægean Sea, on the coast of Asia Minor; area, 115 sq. miles; pop. (1927), 16,169. It was the birthplace of Apelles and Hippocrates, and had anciently a celebrated temple of Æsculapius. In Cos was manufactured a fine, translucent kind of silk, much valued by the ancients. Cos is also the name of the principal town, a seaport of some importance formerly. The island yields grain, wine, silk, cotton, and citrons.

Cos was seized by an Italian fleet in 1912, in the course of the Turco-Italian War. During the Balkan War an agitation arose among the islanders of Cos for union with Greece, but it was agreed by the Treaty of London (13th May, 1913) that the final disposition of all the Ægean Islands should be left to the Powers. By the Treaty of Sèvres Greece obtained the Ægean Islands, to be ceded to her by Italy, with the exception of Rhodes. By the Treaty of Lausanne, however, Cos became definitely Italian.

COSCINOMANCY (Gr. *koskinon*, sieve, and *manteia*, divination). Divination practised in ancient times by means of a sieve and a pair of shears, and employed for the purpose of discovering thieves. "The sieve," writes Tylor in *Primitive Culture*, "was held hanging by a thread, or by the points of a pair of shears stuck into its rim." The names of the suspected persons were mentioned, and at the mention of the name of the thief, the sieve was supposed to turn or swing or fall.

COSELEY. An urban sanitary district of West Staffordshire, forming a suburb of Wolverhampton. It has extensive iron and other manufactures. Pop. (1931), 25,137.

COSENZA (ko-sen'tsà). An episcopal city of Southern Italy, capital of province of Cosenza, or Calabria Citeriore, 150 miles S.E. of Naples; pop. 35,814. It has manufactures of silk, pottery, and cutlery; the environs are beautiful, and produce abundance of corn, fruit, oil, wine, and silk.—The province has an area of 2566 sq. miles, and a pop. of (1931), 550,490.

COSGRAVE, William Thomas. Irish politician. Born in Dublin in 1880, he was educated by the Christian Brothers. In 1909 he was elected to the Corporation of Dublin, and from 1916-22 he was chairman of its finance committee. Having joined the Sinn Fein party, he was elected an M.P. in 1917, and was a member of the provisional government set up in Dublin, being minister for local government. In Aug., 1922, he succeeded Griffith as president of the executive, and when the Free State came into being in Dec., 1922, he was its first political head. He retained his position till 1932, when his party was defeated at the general election.

COSHERING, or **COSHERY.** An old feudal custom in Ireland by which the lord of the soil had the right to lodge and feast himself at a tenant's house. This tribute or exaction was at length commuted for a quit-rent. The English based upon this right the practice of *coyne and livery*.

COSMAS, surnamed **Indicopleustes** ("the Indian navigator"). An Alexandrian merchant and traveller of the sixth century; afterwards a monk. He wrote several geographical and theological works, the most important of which extant is the *Topographia Christiana*. The author tries to prove that the earth is a parallelogram bounded by walls, which meet and form the vaulted roof which we call the sky. An English translation of the *Topographia Christiana* was published in 1897.

COS'MISM. *See* POSITIVISM.

COSMOGONIES, Mythological. The earliest recorded theories regarding the beginning of things are found in

the Pyramid Age Texts of Ancient Egypt (c. 2700 B.C.). One is that all things had their origin in primeval water on which appeared a lotus, the symbol of the womb of the mother goddess. From the lotus blood emerged the sun god, Atum, who created the other gods, including Ptah of Memphis, and Thoth, the moon god. Ptah was the divine artisan who hammered out the iron firmament and set the world in order. The Memphites believed that Ptah was assisted by eight emanations of himself in dwarf forms, and that he was in himself the personification of the Universe, his eyes being the sun and moon. He was also regarded as the divine potter who shaped the sun and moon and the first man and woman on his potter's wheel.

The solar cult of Heliopolis and the Ptah cult of Memphis fused their beliefs, and the germ of the doctrine of the "Logos" emerged. Ptah was then regarded as the "heart (mind) and tongue (word) of the gods." The idea of creation originated in the heart (mind), and the tongue repeated the thought of the mind. All things thus had origin in the thought of the god, and came into existence as the god expressed his thoughts. (Cf. Breasted, *Religion and Thought in Ancient Egypt*, pp. 45 *et seq.*).

Other ideas were that the world was hatched from an egg laid by the cosmic goose, that at the beginning the earth and sky goddess were separated by one of their sons, and that the goddess gave birth to sun and moon, or that mankind, wild beasts, reptiles, vegetation, metals, etc., had origin from the body moisture (tears, saliva, etc.) of the sun god. The early Osirian cult appears to have believed that the universe was shaped when Osiris was slain and his body mutilated.

In Babylonia there were various theories. One was that the world was set in order after the younger gods overcame their demoniac ancestors. Tiamat, the Great Mother dragon, was slain by Marduk; her blood flowed as water, and part of her body formed the sky and part of it the earth. Another theory was that the world was formed by the god who laid reeds on the water and caused mud to form. The first man was formed from a reed and river clay, or from a bone and clay mixed with blood. Both the Babylonians and Egyptians believed that the world was surrounded by water, the Great Circle (Okeanos). In the Pyramid Texts Osiris is (as the serpent-dragon or leviathan) the "encircler" of the world. This idea is found in Norse mythology, which tells of the world-encircling Midgard serpent. In the Icelandic Eddas the gods slay Ymir and cut up his body. His blood becomes the sea, his flesh the land, his bones the mountains, his hair the trees, his skull the heavens, his brains the clouds.

The Chinese P'an Ku is similarly a world giant. He emerged from the cosmic egg. One myth tells that he formed the world with his hammer, like the Egyptian Ptah; another, that his body was cut in pieces to form the earth, as in the Ymir myth. Additional details are that his eyes became the sun and moon, and that the parasites on his body became human beings. The cosmic egg figures in Indian myths, as does also the idea that the universe had origin in the mind of Brahma. The first god split himself, and one part became a goddess, who gave birth to all things. Ahura Mazda is the Iranian creator of the gods, mankind, and the material world, and Ahriman of evil spirits. In the Shinto mythology of Japan the god Izanagi and the goddess Izanami, the descendants of the elder deities, constructed a world-house on the first island they formed by stirring the ocean with a jewelled spear, and gave birth there to deities and islands. These later deities are the ancestors of the various tribes.

Greek theories appear to have been derived from the older civilizations, including the belief in the eternity of matter. Anaxagoras was the first to teach that the universe was created by the Supreme Being from nothing. In Greece, India, China, Mexico, etc., the older theories were systematized and embraced in the doctrine of the World's Ages, traces of which are found in Babylonia and Egypt. In Mexico the universe had a solar origin. Several suns perished, and with them the human races, through lack of nourishment. A great variety of myths resembling those of the Old World prevailed in the Americas and in Oceania. In Celtic mythology the idea of the eternity of matter is fundamental, and the races are descended from deities who came from other lands.

COSMOG'ONY (Gr. *kosmos*, world, and *gonē*, generation). A theory of the origin or formation of the universe. Such theories may be comprehended under three classes:—
1. The first represents the world as eternal, in form as well as substance,
2. The matter of the world is eternal.

but not its form. 3. The matter and form of the universe are ascribed to the direct agency of a spiritual cause; the world had a beginning and shall have an end.

Aristotle appears to have embraced the first theory; but the theory which considers the *matter* of the universe eternal, but not its *form*, was the prevailing one among the ancients, who, starting from the principle that nothing could be made out of nothing, could not admit the creation of matter, yet did not believe that the world had been always in its present state. The prior state of the world, subject to a constant succession of uncertain movements which chance afterwards made regular, they called *chaos*. The Phœnicians, Babylonians, and also Egyptians, seem to have adhered to this theory. One form of this theory is the atomic theory, as taught by Leucippus, Epicurus, and Lucretius. According to it atoms or indivisible particles existed from eternity, moving at hazard, and producing, by their constant meeting, a variety of substances. After having given rise to an immense variety of combinations, they produced the present organization of bodies.

The third theory of cosmogony makes God, or some deity, the Creator of the world out of nothing. This is an ancient and widely spread theory, and is that taught in the book of Genesis. Anaxagoras was the first among the Greeks who taught that God created the universe from nothing. The great races of mankind, the Semites, Egyptians, and Aryans, all originated cosmogonies. The concept of creation *ex nihilo* was, however, practically unknown to and is present neither in Babylonian, Egyptian, nor Greek cosmogonies. But in one of the hymns of the *Rigveda* it is stated that "in the primal age of the gods being was born of non-being."

Cosmogony differs from cosmology in this: that the latter aims at understanding the actual composition and governing laws of the universe as it now exists; while the former answers the question as to how it first came to be.—BIBLIOGRAPHY: Agnes Clerke, *Modern Cosmogonies*; Faye, *Sur l'origine du monde, théories cosmogonieques, etc.*

COSMOS. Order or harmony, and hence the universe as an orderly and beautiful system. It is opposed to *chaos*, the state of complete disorder, and in this sense it has been adopted by Humboldt as the title of his celebrated work *Cosmos* (1845-58), which describes the nature of the heavens as well as the physical phenomena of the earth. The original term, meaning order, was first applied to "the world" by Pythagoras.

COS'SACKS. Tribes who inhabit the southern and eastern parts of Russia, and who, under the government of the Tsars, paid no taxes, but performed instead the duty of soldiers. Nearly all of them belong to the Græco-Russian Church, to which they are strongly attached, and to the observances of which they are particularly attentive. They must be divided into two principal classes, both on account of their descent and their present condition—the Cossacks of Little Russia and

Cossacks

those of the Don. Both classes, and especially those of the Don, have collateral branches, distributed as Cossacks of the Azov, of the Danube, of the Black Sea, of the Caucasus, of the Ural, of Orenburg, of Siberia, of the Chinese frontiers, and of Astrakhan.

Origin.—Writers are not agreed as to the origin of the Cossacks and their name. The very word Cossack, and its etymology, have given rise to speculation, and many have been the explanations suggested by scholars. Some are of opinion that the word Cossack is of Polish origin, meaning goat, as the first Cossacks used to wear goatskins, whilst others trace it to a Spanish word *casacc*, from which the French derive the word *casaque*. The name of Cossack is, however, most probably derived from a Tartar word

meaning *light-armed man*. Originally a Cossack, or *Kozak*, meant a marauder, a freebooter, or even a pirate.

Appearance.—The Cossacks are a mixed Caucasian and Tartar race, and in personal appearance bear a close resemblance to the Russians, but are of a more slender make, and have features which are decidedly more handsome and expressive.

Constitution. — Originally their government formed a kind of democracy, at the head of which was a chief or hetman of their own choice ; while under him was a long series of officers with jurisdictions of greater or less extent, partly civil and partly military, all so arranged as to be able on any emergency to furnish the largest military array on the shortest notice. Under the rule of the Tsars of Russia the democratical part of the Cossack constitution gradually disappeared. The title of chief hetman was vested in the heir-apparent to the throne, and all the subordinate hetmans and other officers were appointed by the Crown. Each Cossack was liable to military service from the age of eighteen to thirty-eight, and had to furnish his own horse. They supplied the former Russian Empire with one of the most valuable elements in its national army, forming a first-rate irregular cavalry, and rendering excellent service as scouts and skirmishers.

In 1570 they built their principal " stanitza " and rendezvous, called Tsherkask, on the Don, not far above its mouth. As it was rendered unhealthy by the overflowing of the island on which it stood, New Tsherkask was founded in 1805 some miles from the old city, to which nearly all the inhabitants removed. This forms the capital of the country of the Don Cossacks, which, until the revolution of 1918, constituted a province or government of Russia, and had an area of 63,532 sq. miles, and a pop. of 4,013,400.—Cf. W. T. Cresson, *The Cossacks : their History and Country*.

COSSIMBAZAR'. A town in Moorshedabad district, Bengal. It was one of the earliest settlements of the East India Company, and was formerly a place of great importance.

COSTA, Alfonso Augusto de. Portuguese statesman, born in 1871, died 1915. He studied at Coimbra, and became professor of law in 1896. Elected to the Cortes in 1899, and again in 1900, he soon showed himself to be an enemy of the monarchial system. An enthusiastic supporter of the revolution which resulted in establishing the Portuguese Republic in 1910, he became Premier in Jan., 1913.

COSTA, Lorenzo. Italian painter. Born at Ferrara in 1460 he passed most of his early life at Bologna, where he painted a number of frescoes and was associated with the artist Francia. Later in life he settled at Mantua where he died in 1535. His *Madonna and Child Enthroned* is in the National Gallery, London.

COSTA, Sir Michael. Musical composer and conductor, born at Naples of an old Spanish family 1810, died 1884. In 1828 he came to England, and in 1839 became a naturalized British subject. He was conductor of the Philharmonic Society, the Sacred Harmonic Society, the opera at Her Majesty's, and the Handel Festivals. He was the first master of the art who had appeared in England. His chief works are the opera *Don Carlos*, and the oratorios *Eli*, produced at the Birmingham Festival in 1855, and *Naaman*. He was knighted in 1869.

COSTA RICA. The most southern state of the republics of Central America ; bounded north by Nicaragua, east and north by the Caribbean Sea ; east and south by Panama ; and south and west by the Pacific. Area, about 23,000 sq. miles. A controversy concerning the true boundary line between Costa Rica and Panama almost led to war in 1921, but Costa Rica, after referring the matter to the United States, made the necessary cession to Panama.

The country is intersected diagonally by the primary range or cordillera of the isthmus, which throws off numerous spurs on either side. The principal range contains several lofty eminences (the highest 11,740 feet) and volcanoes, both active and extinct or dormant. Costa Rica is said to contain some rich gold-mines ; at present, however, they are not worked to any great extent. Silver and copper are also found.

The country is extremely fertile. Coffee, rice, and maize are raised on the tableland in the interior ; and bananas, cacao, sugar, cotton, and tobacco are cultivated in the low coast-regions. Coffee and bananas are the chief products. The forests are valuable.

The capital is San José, and the two established ports are Punta Arenas, on the Pacific side, and Porto Limon, on the Caribbean Sea. It has been an independent state since 1821, from 1824 to 1839 forming a part of the Central

American Confederation, but the exact political status of the country was not assured until 1848, when an independent republic was proclaimed.

The republic is governed by a constitution promulgated in 1871, and modified repeatedly since, the last occasion being 8th June, 1917. Universal suffrage was adopted in 1913. There are 415 miles of railway. The revenue is £1,661,240; and there is a debt of over £4,000,000. The exports annually amount to over £3,000,000, mostly coffee and bananas. Roman Catholicism is the religion of the state, but there is entire religious liberty under the constitution. Elementary education is compulsory and free. Pop. (1931), 516,031, mostly of Spanish descent.—BIBLIOGRAPHY: G. Niederlein, *The Republic of Costa Rica*; J. B. Calvo, *The Republic of Costa Rica*; R. Fernández Guardia, *History of the Discovery and Conquest of Costa Rica.*

COSTEL'LO, Dudley. Novelist and journalist, born in Ireland 1803, died in London 1865. A constant contributor to many journals and magazines, and author of several popular works of fiction, as *Faint Heart never won Fair Lady.* His sister, **Louisa Stuart Costello,** born 1815, died 1870, published two romances, entitled *The Queen Mother*, or *The Queen's Poisoner* (1841), and *Clara Fane* (1848), a poem called *The Lay of the Stork* (1856), and various historical and descriptive works.

COSTER, Laurens (called **Janszoon,** that is, *son of John*), whose name is connected with the origin of printing. Was born in Haarlem in 1370 or 1371, died about 1440. He was sacristan (*Koster*) of the parochial church at Haarlem, and from this office he derived his surname. According to a statement first found in Junius's *Batavia* (1588), he was the original inventor of movable types, and on this ground the Dutch have erected statues in his honour. But in 1870 a Dutchman, Dr. Van der Linde, professed to have demolished the claims of Haarlem to the invention of printing, and to have established that Holland, like other countries, was indebted for it to the Mayence school. This conclusion was rejected by J. H. Hessels, who, on carefully investigating the matter, thought it highly probable that Coster was the inventor.

COST'MARY (from Lat. *costos*, an aromatic plant, and *Mary*, the Virgin), or **ALECOST** (*Chrysanthemum Balsamita*). A composite herbaceous plant, a hardy perennial, a native of Italy, introduced into Britain in 1568, and common in almost every rural garden. It was formerly put into ale to give it an aromatic flavour, hence the name *Alecost.*

COSTS (Lat. *constare*, to cost, consist). A term used in English law to denote legal expenses. They fall into two divisions: (*a*) costs as between party and party, comprising only necessary expenses of process—as a general rule costs follow the success of a lawsuit, and are awarded on this basis; and (*b*) costs as between solicitor and client, comprising all expenses reasonably incurred in the prosecution of the client's interests. Apart from written agreement, a signed Bill of Costs must be rendered to the client, and thereafter one month must elapse before action for payment can be taken, in order that, if the client so desire, the bill may be taxed.

COS'TUME (Lat. *costuma*, from *consuetudo*, custom). Distinctive garments worn by man and woman among different nations and races, and at different periods, and regarded from the point of view of style and adornment rather than from that of simple clothing. The history of costume and its evolution through centuries is practically the history of civilization and of human society. Human aspirations and taste, man's personal habits and customs, rank and social position, and even vice and virtue, have been reflected in the costumes adopted by men of different nationalities, and at various epochs of history. The costume is a symbol of the age, of the subtle qualities and characteristics of race and epoch, and of the degree of civilization. The study of costume by the aid of monuments, sculptures, and paintings helps us to understand the march of civilization. Simplicity and extravagance, costliness and sobriety, frivolity and modesty are all reflected in the costumes of past ages. The French have a proverb, *l'habit fait le moine*, and it is no exaggeration to say that the costume made the race and also the individual. The Romans spoke of the Egyptian as *liniger* (linen-wearing), of the Greek as *chlamydatus* (cloaked), of the man of the North and the ancient Briton as *bracatus* (breeches-wearing), of the Arab and the Persian as *mitratus* (turbaned), and of the German as *comatus* (long-haired).

The earliest indications of costume come from tropical and warm countries, a fact which tends to prove that the origin of costume is not to be sought entirely in the necessity of protection against the inclemency of the weather. The feeling of shame,

Greek Costume from a Breastplate

The men are wearing the long undergarment (*chiton*), and upper garment (*chlaine, pharos, himation*) fastened apparently across the shoulders with a brooch. The woman is wearing the *chiton*.

too, is, as Westermarck rightly observes, "far from being the cause of man's covering his body." The feeling of modesty and shame was not so much the cause as the effect of dress.

Costumes or dresses were worn not so much because man wished to cover his nakedness, but because man and woman wished to make themselves attractive to each other. Costume was also regulated in ancient times, as to some extent also in modern times, by a desire to indicate the rank and position of the wearer. Thus the higher classes wore many more clothes than the lower.

The costume of every nation was influenced by various factors, such as climate, character, and mode of life. Originally, therefore, costume was *national*, showing the difference existing between the various races.

Egyptian.—The costume of the old Egyptians, which we know from the wall decorations of Egypt, consisted chiefly of a loin-cloth tied in front, a sort of short drawers, which was afterwards succeeded by a close-fitting garment leaving the arms free and reaching below the knees. A short skirt suspended from the waist was the garment adopted by the Babylonians. The nature of the material and the dimensions of the garment indicated the rank and position of the wearer. The Greeks and Romans united appreciation of outline to a sense of grace in drapery.

Grecian.—At all epochs of their history the Greeks employed for their dress an oblong piece of material, which they transformed into either a long shirt or a coat. All the subsequent changes in Greek dress were only the result of the manner and method in which this material was draped round the body, the degree of softness of the material, and its ornamentation. Generally speaking, Greek dress was distinguished by its simplicity. The chief garments of the Greeks were either *endymata*, lower garments worn next to the body, or *epiblemata*, over-garments. The principal Greek garment worn next to the body was the *chiton*, a long piece of material folded round the body, with apertures for the arms, the material being fastened about the shoulder with a button or a clasp. This loose garment was open from the thigh downwards, and was fastened at the hips with a band, the garment being pulled through this band so as to make it shorter. Greek women,

too, wore the *chiton*, which was only longer than that of the men. It was secured by a band under the breasts and also at the hips.

Over this garment was worn the *peplos*, a sort of mantle consisting of an oblong ample piece of material draped round the body, under the arms, and then over the shoulders. The material employed was either wool among the Dorians, or linen among the Ionians. The women also employed a third material called *byssos*, a sort of cotton tissue. The predominant colour of these garments was white, but violet and saffron, cherry and purple were also appreciated. The garments were frequently embroidered with silver and gold. Greek women devoted much care to their head-gear. Both men and women wore sandals, shoes, and other foot-gear. The Greeks, it may be added, were acquainted with the secret arts of the toilet. They knew of cosmetics and wore wigs. The ladies, and perhaps not only the ladies, painted their faces.

Roman.—The Romans adopted from the Greeks the *chiton*, i.e. the garment adjusted to the body and reaching to the knee for the man, and to the ankle for the woman. This they called *tunica*, a word which has become familiar to us as *tunic*. The garment was either linen or woollen, and its sleeves, at first scarcely reaching to the elbows, afterwards came down to the wrist. The patricians wore over the *tunica* the *toga*, ample enough to cover the whole person of the wearer; it could also be pulled over the head for protection against the weather. The *toga* was wrapped round the body somewhat like the plaid of the Scottish Highlanders. The outer garment of the plebeians was a cloak of coarse material with a cowl attached to it to cover the head. The tunic worn by the Senators had a broad stripe of purple sewed on the breast. The tunic was secured by a belt or girdle. The Romans, too, like the Greeks, had a variety of sandals and shoes. Roman ladies wore ear-rings, necklaces, and bracelets.

Roman Costume

From a statuette representing a fashionable lady of Horace's period. She wears three garments: a long flowing robe caught up by a girdle just above the hips, so as to make the crinkled fold; a loose vest rather open at the neck, which hangs straight, and is confined below the breasts by another girdle; and lastly a sort of opera-cloak thrown over her shoulders, and kept in place by brooches.

Roman Costume
Man wearing the *Toga*

Gallic.—The costume of the Gauls denoted their Oriental origin. It consisted of close-fitting pantaloons or loose trousers, called by the Romans *bracæ*, reaching as far as the ankles, where they were met by shoes of leather. Such was also the costume of the early Britons. British and Gaulish women wore a long tunic reaching to the ankles, and

over it a shorter one called *guanacum*, whence is derived the word *gown*.

When Rome became mistress of the world, and united under her sway the numerous nationalities of the Orient and of the Occident, the Roman costume became fashionable, and for the first time the idea of fashion was introduced and developed. It affected the life, manners, customs, and costumes of the world. Rome in her turn was supplanted by Byzantium, and Oriental influence became predominant. The Crusades having to a certain extent pulled down the barriers existing between the various nations and brought East and West nearer, national differences in costume diminished, and fashion was developed. France and Spain led the way, and their influence made itself felt in other countries.

In the fifteenth and sixteenth centuries French costume was influenced by Italy. Towards the middle of the sixteenth century it was the Spanish costume that predominated, and it was adopted and developed in France and in England. A new era was inaugurated by the reign of Louis XIV., which again witnessed the sway of France. Since that time French costumes have been adopted all over the civilized world. Thus the historical and national costume gradually disappeared, and is only to be met with among the rural populations of Europe, and among the Oriental and Asiatic nations. But the national costume of the country-folks, too, is gradually disappearing under the influence of Dame Fashion.—BIBLIOGRAPHY: A. Racinet, *Le Costume Historique*; J. R. Planché, *A Cyclopædia of Costume*; G. Hill, *A History of English Dress from the Saxon Period to the Present Day*; Mrs. Aria, *Costume*; T. Hope, *Costume of the Ancients*.

COSWAY, Richard. English miniature painter, born 1740, died 1821. He received his artistic education in London, and soon made his mark, becoming an associate of the Royal Academy in 1770, and an academician next year, and exhibiting a number of miniatures in the academy's exhibitions. He was appointed principal painter to the Prince of Wales, was quite the rage among people of fashion, and naturally made a large income, but was noted for vanity, extravagance, and eccentricity. The largest collection of his miniatures is in Windsor Castle.

CÔTE-D'OR (kōt-dōr). That is, hill or hillside of gold from the excellence of its vintages, a chain of hills in the east of France, height from 1400 to 1800 feet.

CÔTE-D'OR. An inland and eastern department of France, part of the old province of Burgundy, having Dijon as its capital. It is watered by the Seine, the Saône, and their affluents, and derives its name from the Côte-d'Or hills, which traverse it from N.E. to S.W. Area, 3391 sq. miles. The vineyards of the eastern slopes of the Côte-d'Or produce the celebrated wines of Upper Burgundy. Iron, coal, and marble are found. Pop. (1931), 333,800.

COTENTIN (kō-tàn-taṇ). A peninsula of Northern France, projecting into the English Channel, forming part of the department of La Manche and of Normandy, celebrated for its cattle and butter. Cherbourg is the largest town.

CÔTES-DU-NORD (kōt-dü-nōr). A maritime department in the north of France, forming part of ancient Brittany; capital, St. Brieuc. Area, 2786 sq. miles. The coast extends about 150 miles, and the herring, pilchard, and mackerel fishing is actively pursued. One of the main branches of industry is the rearing of cattle and horses. In manufacturing industries the principal branch is the spinning of flax and hemp, and the weaving of linen and sail-cloth. Among the minerals are iron, lead, and granite. Pop. (1931), 539,531.

COTI'DAL LINES. A system of lines on a globe or chart marking the places where high-water takes place at the same instant.

COTIL'LION. A brisk dance of French origin performed by eight persons together, resembling the quadrille which superseded it. It was a fashionable dance at the court of Charles X. The name is now given to a dance which sometimes winds up a ball, and which is danced by any number of dancers and with a great variety of figures, the pair of dancers following in this the leading pair, and partners being successively changed.

COTMAN, John Sell. English architectural draughtsman and landscape painter, born 1782, died 1842. Nearly 300 of his water-colours, including *Breaking the Cold* and *Greta Bridge*, are in the British Museum. Of his oil-pictures one, *Wherries on Breydon*, is in the National Gallery.

COTO. The reddish-brown, aromatic and slightly bitter bark of *Palicourea densiflōra*, ord. Rubiaceæ, a tree of South America, imported into Europe and used as a remedy in diarrhœa and profuse sweating.

COTONEAS'TER. A genus of small trees or trailing shrubs, nat.

ord. Rosaceæ. *C. vulgāris* is a rare British plant, having rose-coloured petals and the margins of the calyx downy. The other species are natives of the south of Europe and the mountains of India. They are all adapted for shrubberies, and for covering walls.

COTOPAX'I. The most remarkable volcanic mountain of the Andes, in Ecuador, about 60 miles N.E. of Chimborazo; lat. 0° 43′ S.; long. 78° 40′ W.; altitude, 19,513 feet. It is the most beautiful of the colossal summits of the Andes, being a perfectly symmetrical truncated cone, presenting a uniform unfurrowed field of snow of resplendent brightness. Several terrific eruptions of it occurred in the course of the eighteenth, nineteenth, and twentieth centuries.

COTRONE (ko-trō'nā). A seaport of Southern Italy, province of Catanzaro, on the site of the ancient Croton. It has a cathedral, and carries on an export trade in fruits. Pop. 10,162.

COTS'WOLD HILLS. A range of hills, England, County Gloucester, which they traverse N. to S. for upwards of 50 miles; extreme elevation near Cheltenham, 1134 feet.—The **Cotswold sheep** are a breed of sheep remarkable for the length of their wool, formerly peculiar to the counties of Gloucester, Hereford, and Worcester.

COTTA, Johann Friedrich, Baron von. An eminent bookseller of Germany, born 1764, died 1832. He began business at Tübingen, but in 1811 removed to Stuttgart. He was the publisher for many great writers in Germany, including Goethe, Schiller, Wieland, Richter, Uhland, Fichte, Hegel, the Humboldts, and others.

COT'TABUS. An ancient Greek game, said to have originated in Sicily, which consisted in throwing wine lees from cups, without spilling, into little basins of metal, suspended in a particular manner or floating in water. The lees made a noise as they struck the basins, and from this noise and from the success of the throw, omens were drawn. As was natural, the omens mostly referred to success or failure in love.

COTTENHAM. Town of Cambridgeshire. It is 6 miles from Cambridge in a district where much fruit is grown. Here the Ministry of Agriculture has established a station for grading and packing apples. Pop. 2470.

The title of **Earl of Cottenham** has been held since 1850 by the family of Pepys. The first earl, Sir Charles Christopher Pepys, was Lord Chancellor in the Liberal ministries of 1836-41 and 1846-50. He died 29th April, 1851. The earl's eldest son is called Viscount Crowhurst.

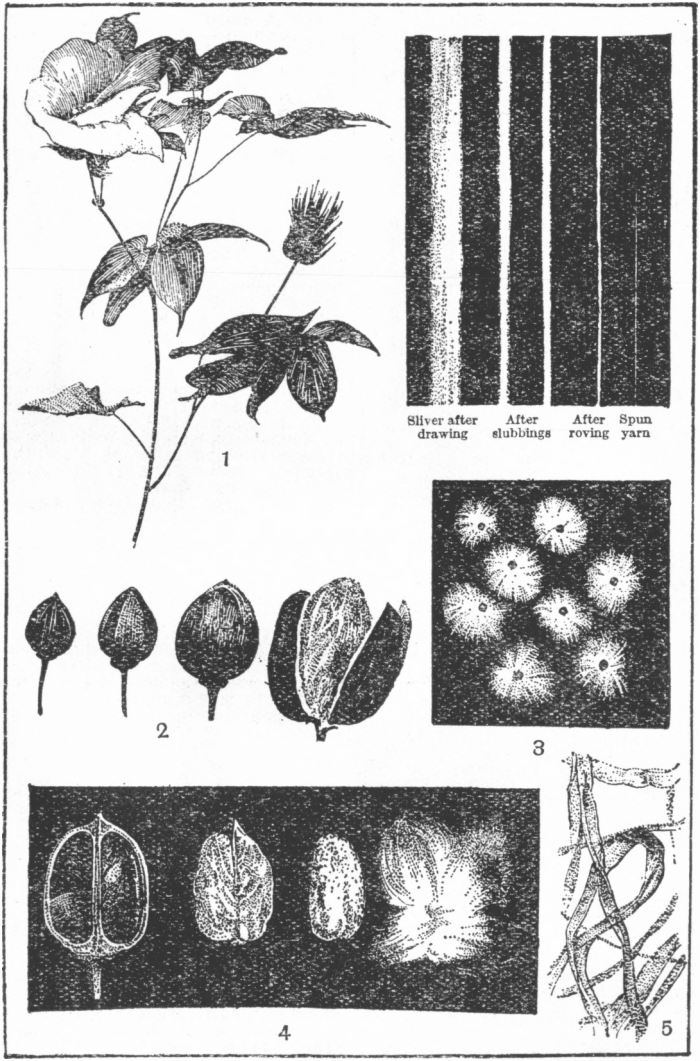
COTTIER TENURE. A system of tenure according to which labourers rent small portions of land directly from the owner, or from a farmer, often giving personal service as part of the rent, and holding by annual tenancy. The term *cottier* as connected with agriculture was derived from Ireland. The evils which resulted from the system led to the new departure of the Irish Land Acts of 1870 and 1881.

COTTIN (kot-an), **Marie** (called **Sophie Risteau**), better known by the name of **Madame Cottin.** French novelist, born 1770, died 1807. In 1790 she married M. Cottin, a banker of Bourdeaux, who died in 1793, and thenceforth she followed literature. Her best-known work is *Élisabeth, ou Les Exilés de Sibérie*; other novels are *Claire d'Albe, Malvina, Amélie,* and *Mathilde.*

COTTINGHAM. An urban district of England, Yorkshire, 4 miles N.W. of Hull, the residence of many people working in Hull. The Hull waterworks are there. Pop. (1931), 6182.

COTTLE, Joseph. A bookseller and publisher of Bristol, and the author of some now almost completely forgotten poems, was born in 1774, died 1853. He was a generous friend to Coleridge and Southey in their early days, and wrote an interesting volume of recollections of those authors. His works include: *Malvern Hills*; *John the Baptist*; *Messiah*; and *Early Recollections, chiefly relating to Samuel Taylor Coleridge.*

COTTON. The name given to the soft cellular hairs which encircle the seeds of plants of the genus Gossypium, nat. ord. Malvaceæ. The genus is indigenous to both the Old and the New World, and the plants are now cultivated all over the world within the limits of 30° north and south of the equator. All the species are perennial shrubs, though in cultivation they are sometimes treated as if they were annuals. They have alternate stalked and lobed leaves, large yellow flowers, and a three- or five-celled capsule, which bursts open when ripe through the middle of the cell, liberating the numerous black seeds covered with the beautiful filamentous cotton.



1, Cotton Plant (*Gossypium herbaceum*) in flower and fruit. 2, Development of the Cotton Boll. 3, Section of Seeds with Cotton attached. 4, Ripe Cotton Boll opened up. 5, Texas Cotton Fibre (highly magnified).

The North American cotton is produced by *Gossypium barbadense* and *G. hirsutum*, and two well-marked varieties are cultivated, the long-staple cotton, which has a fine soft silky fibre, about 2 inches long, and the short-staple cotton, which has a fibre little over 1 inch long adhering closely to the seed. The long-staple variety known as Sea Island cotton holds the first place in the market. It is grown in some of the southern states of America, especially on islands bordering the coast. The cotton grown in South America, and most Egyptian cotton, is obtained from *G. brasiliense*, called also kidney cotton. The indigenous Indian species is *G. herbaceum*, which yields a short-stapled cotton. It is grown throughout the Mediterranean region as well as in Asia.

Cultivation.—The mode of cultivation is usually as follows :—The seeds are sown in the spring in drills of about a yard in width, the plant appearing above ground in about eight days afterwards. The rows of young plants are then carefully weeded and hoed, a process which requires to be repeated at two or three subsequent periods. No hoeing takes place after the flowering has commenced, from which a period of seventy days generally elapses till the ripening of the seed. To prevent the lustre of the cotton wool from being tarnished, the pods must not remain ungathered longer than eight days after coming to maturity. The cotton wool is collected by picking with the fingers the flakes from the pods, and then spreading out to dry, an operation which requires to be carefully performed. The cotton now comes to be separated from the seeds, a process called "ginning," which is now performed by a ginning-machine. After being cleansed from the seeds, the cotton wool is formed into bales, and is now ready for delivery to the manufacturer.

Cotton has been cultivated in India and the adjacent islands from time immemorial. It was known in Egypt in the sixth century before the Christian era, but was then probably imported from India. It was not till a comparatively late period that the nations of the West became acquainted with this useful commodity, and even then it appears only to have been used as an article of the greatest luxury.

The introduction of the cotton-shrub into Europe dates from the ninth century, and was first effected by the Spanish Moors, who planted it in the plains of Valencia. Cotton manufactories were shortly afterwards established at Cordova, Granada, and Seville; and by the fourteenth century the cotton stuffs manufactured in Granada had come to be regarded as superior in quality to those of Syria. About the fourteenth century cotton thread began to be imported into England.

In China the cotton-shrub was known at a very early period, but cotton does not appear to have been turned to any account as an article of manufacture till the sixth century of the Christian era, nor was it extensively used for that purpose till nearly the middle of the fourteenth century.

In the New World the manufacture of cotton cloth appears to have been well understood by the Mexicans and Peruvians long before the advent of Europeans. It was planted by the English colonists of Virginia in 1621, but only as an experiment, and the amount produced was long very small. About 1780-90 the British West Indies supplied Britain with most of its raw cotton, other sources being Asia Minor and the Levant, Brazil, and the East Indies. The United States then began to export cotton in large quantities, and soon outdistanced all other countries. The following table gives world production in bales of 500 lb. for 1929–30 :—

Country.	Production.
America	14,514,000
India	5,260,000
Egypt	870,000
Russia, Turkestan, and Caucasus	2,500,000
China	175,000
All Others	4,429,000
Total	27,748,000

Great Britain is developing new Empire fields, particularly in Africa. The extensive irrigation schemes being carried out in Egypt will increase production. Kenya, Nyasaland, Tanganyika, and Australia are still in the experimental stage, but are capable of vast expansion. Indian cotton being of short staple is useless for British manufacturers, and all the exports go to China and Japan.

In the British cotton factories are normally employed approximately 577,000 hands, and the value of the goods exported in 1931 was £56,593,019. Almost every country in the world purchases British cotton goods, but British India is the largest market of all. The value of our imports of raw cotton was £27,153,009 in 1931. The following table shows the

world's consumption of all kinds of cotton in bales of 500 lb. :—

Country.	Consumption.
Great Britain	2,465,000
Europe	7,889,000
Asia	7,713,000
United States	6,060,000
Canada	200,000
Mexico	215,000
Brazil	414,000
All Others	253,000
Total	25,209.000

See COTTON MANUFACTURE.—BIBLIOGRAPHY: S. J. Chapman, *The Lancashire Cotton Industry*; G. W. Burkett and C. H. Poe, *Cotton: a Practical Manual*; Dana, *Cotton from Seed to Loom*; R. J. Peake, *Cotton from the Raw Material to the Finished Product*; Sir G. Watt, *Wild and Cultivated Cotton Plants of the World*; J A. Todd, *The World's Cotton Crops*.

COTTON, Charles. An English writer, born 1630, died 1687. He lived the life of a country gentleman, being a great angler and skilled in horticulture. His works are numerous, including: *The Scarronides, or Virgil Travestie*; *Instructions how to Angle for a Trout and Grayling in a Clear Stream*; a supplement to his friend Izaak Walton's *Compleat Angler*; *Poems on Various Occasions*; translations of Montaigne's *Essays* and Corneille's *Horace*.

COTTON, Sir Robert Bruce. English antiquary and collector of literary relics, born 1571, died 1631. He assisted Camden in compiling his *History of Elizabeth*, and was made a baronet in 1611. He wrote numerous antiquarian pamphlets, but he is chiefly remembered for the magnificent library of ancient charters, records, and other MSS. which he collected. The collection passed to his heir, and was presented to the nation in 1700. After being partially destroyed by fire in 1731, it was placed in the British Museum in 1753.

COTTON FAMINE. The destitution caused by the outbreak of the American Civil War (1861-64) in the English cotton manufacturing districts, especially in Lancashire. The cotton supply failed on account of the blockade of the southern ports of the United States, and the mill-owners had finally to close their mills —nearly two millions of people being reduced to great distress. A Relief Fund was started, and a Relief Act passed by Parliament. By June, 1865, the distress was at an end.

COTTON-GRASS. The popular name of plants of the genus Eriophŏrum, ord. Cyperaceæ or sedges. Several species occur in Britain, and the white cottony substance they produce is used for stuffing pillows.

COTTON MANUFACTURE. In its widest application, includes all the processes involved from the time that the raw cotton fibre reaches the manufacturing centres to the time when the finished cloth is dispatched to its destination. It thus embraces the operations of spinning, weaving, and finishing, as well as those of bleaching, dyeing, and printing. It is usual, however, to consider cotton manufacture solely as the operation which converts yarns into cloth, in other words, it is another name for cotton-weaving; the term and operation are thus quite distinct from the so-called operation of cotton-spinning and the processes which are necessary in modern practice to convert the raw fibre into yarn. The general and accepted subdivision of cotton manufacture involves cotton-spinning, cotton-weaving, and cotton-finishing, the last of which may or may not include bleaching, dyeing, and printing.

Cotton-spinning.—Although cotton-spinning is the last operation in a series, and is the method by means of which a comparatively thick and slightly twisted collection of fibres is reduced in diameter to the size of the ultimate yarn with the necessary number of turns per inch, the term is used, in general, in a much wider sense, since it indicates all the operations, except *ginning*, involved in the treatment of the material from the raw fibre to the finished yarn. The cotton-seeds are separated from the fibre by the ginning-machine, after which the fibre is press-packed into bales and dispatched from the growing areas to this and other countries.

The first operation in a so-called spinning-mill is to open the material into a somewhat loose condition suitable for subsequent operations, and to eliminate as much dirt as possible. This is done in a machine termed a *bale-breaker*. Various qualities of cotton fibres are then mixed or blended in order to make a suitable mixture for the type of yarn it is intended to spin. The cotton is delivered from the breaker either to a mixing-room, to a hopper-feeder, or to the *opener*. In this machine the fibres are loosened and a further quantity of dirt is removed. In addition the fibres are arranged into a thin film, which is rolled into what is known as a *lap*. About

four of these laps are then fed into the *scutcher*, which cleans the yarn and forms other laps suitable for the next machine, the *carding-engine* or *card*. This machine is provided with a number of different-sized rollers rotating at different surface speeds; the peripheral surfaces of the rollers are covered with fine projecting wires; the wires of some of the rollers hold the fibres, others comb them, and others *doff* them, and all the time the material is being drawn out or attenuated. The fibres are cleaned, arranged more or less parallel to each other, and ultimately *doffed* in the form of a wide thin film, which is condensed to a much narrower but thicker ribbon-like group termed a *sliver*, and delivered into a sliver-can.

If the material is for high-class yarns, the slivers may be treated by a *comber*, but for ordinary types the slivers from the card are taken direct to the *drawing-frame*, where from four to six slivers are drawn out—the fibres caused to slide on each other in virtue of the different surface speeds of the rollers—united at the delivery side, and a comparatively thin sliver delivered by a *coiler* into a sliver-can. This so-called *doubling* and *drafting* helps to make a uniform sliver, and may be repeated a few times to obtain a high degree of uniformity. The sliver-cans from the last drawing-frame are now taken to the *slubbing-frame*, where a further draft takes place, and the sliver is converted into a soft thread, circular in section, by imparting a slight amount of twist; the so-called *slubbing* thus formed is wound by flyers into a suitable package. This operation is repeated in similar flyer-machines termed *intermediate slubbing-frame*, *roving-frame*, and *jack-frame*, the latter used only for fine yarns. The slightly twisted material, termed *rove yarn* or *roving*, is taken to the spinning-frame, where a further draft takes place, and a considerable amount of twist is imparted to the drawn-out rove to form the finished yarn.

At least three distinct methods of spinning may be practised: (1) throstle-flyer spinning; (2) ring-spinning; (3) mule-spinning. The two latter are most extensively used, and the mule only for the very finest yarns. When the yarn leaves the spinning-frame or mule, it is ready for the operations which are considered necessary or desirable to prepare the warp and weft yarns for the loom, or for other purposes where weaving is unnecessary. Up to the middle of the eighteenth century the conversion of fibre to yarn was performed direct by means of the spinning-wheel and distaff. Then attempts were made to dispense with the hand-wheel, and to substitute more elaborate apparatus.

In the transition from hand- to machine-spinning, Paul, Wyatt, Hargreaves, Arkwright, and Crompton played important parts. The introduction of rollers is attributed to Paul and Wyatt, but the chief credit for the evolution of cotton-spinning machinery is given to the last three inventors in the above list. James Hargreaves, a weaver of Stand-hill, near Blackburn, invented the spinning-jenny about 1767, and placed the spindles vertically instead of horizontally; Richard Arkwright, a barber of Preston and Bolton, invented the water-frame in 1769, a method of spinning with the aid of rollers; while between 1774 and 1779 Samuel Crompton of Bolton invented the mule-jenny, the forerunner of the modern self-acting mule. The principles embodied in these three patents form the chief features in all modern preparing- and spinning-machinery.

Cotton-Weaving.—The thickness of the yarns, the quality of the fibre, the single or multiple arrangement of the yarns, and their freedom from knots, slubs, or other imperfections depend upon the character of the work, and the desired conditions of the ultimate fabrics or articles into which the yarns are to be introduced. In the first place, the yarns which are intended to be woven into ordinary cloth are divided into two distinct groups, *warp* and *weft*, although in the cotton trade these are usually designated respectively *twist* and *weft*.

The warp yarn or twist is almost invariably stronger than the weft, because it is subjected to a much higher tension during the weaving process; it has to undergo several distinct operations before it is ready to be interwoven as a set or group of warp *threads* with another set or group of weft *picks*. In the process of weaving, all the warp threads are operated collectively and simultaneously, whereas the weft picks are introduced singly, except on very rare occasions when two shots or picks of weft may be introduced at the same time. Both warp and weft may have to be treated specially before they undergo the usual operations of weaving, in order to prepare them for this important process of manufacture. Thus they may have to be bleached, dyed, or bleached and dyed, mercerized, gassed, cleared, doubled or twisted, printed, stained, or otherwise prepared according to

requirements. In general, however, the yarns are woven in the natural colour and without any special treatment, in which case they may pass direct to the two distinct departments — warp-winding and weft-winding.

The weft may, however, come direct from the mule-spindles in the form of cops ready to be placed on the tongue or peg in the well of the shuttle. At other times, the weft is rewound on to pirn bobbins ready for the shuttle, and these constitute practically all that has to be done to prepare the weft for the operation of weaving.

On the other hand, there is a considerable amount of labour required before the warp threads are ready for being operated in the loom to receive the weft. First the warp yarn must be wound either on to bobbins or in the form of *cheeses*, and from this stage one at least of two or three paths may be followed. 1. The bobbins or cheeses may be placed in the *bank* or *creel*, and a warp made direct on to the warping-mill. When the necessary number of threads has been wound on the mill, the *leases* are preserved and the warp is *chained* off, after which it may or may not be starched, mercerized, or dyed, and then wound or beamed on to a large bobbin-shaped structure termed a weaver's beam. A similar warp may be prepared on a linking-machine, where the linking into a chain is performed mechanically, and the warp or chain beamed as above. 2. Three hundred to four hundred of the above-mentioned bobbins or cheeses are placed in a bank, and four, six, eight, or even more beams, often termed warper's reels, are made, each containing three hundred to four hundred threads, and of any desired length up to the holding capacity of the warper's beams. These reels or beams, say six, each filled with say, four hundred threads, are then placed in stands behind a *slasher* or *tape* machine, and all the threads, 6 400 = 2400, placed side by side in one sheet, passed between the starch-rollers, and over the steam-heated cylinders (or perhaps conducted through a hot-air chamber instead), and ultimately all the 2400 threads are wound in a perfectly dry state on to one weaver's beam, or on to several if a long length of warp is required. 3. The necessary number of threads may be deposited on very narrow beams by sectional beaming, and two, three, or more of these beams placed side by side to obtain the desired width for the loom. In all three cases the resulting product is a weaver's beam containing the necessary number and kind of threads to form the desired width of cloth, and, of course, for a definite length as well. The ends of all these threads are then drawn through the *mails* or *eyes* of the healds, then through the openings (*dents* or *splits*) of the reed, and afterwards the warp beam, with its complement of threads, healds, and reed, is taken to the loom to be *gaited*, i.e. the healds tied to the mechanical parts which operate them, the reed placed between the *lay* and the *shell*, and the threads arranged straight and tightly attached in some suitable way to a roller which will draw the cloth slowly forward as it is woven. The number of healds (or leaves of the heald) depends upon the pattern of the cloth, i.e. whether it is plain, twill, or other simple effect, and the kind of loom in which the healds, or their equivalent, are placed, depends upon the extent of the pattern or ornamental design.

The warp and weft are then interwoven with each other according to pattern or designation of cloth, and it will be understood that there is a huge variety, among which might be mentioned calicoes, sheetings, longcloths, twills, sateens, flannelettes, plain and striped drills, shirtings, zephyrs, voiles, towels, poplins, fustians (velveteens, corduroys, moleskins, and the like), brocades, and costume cloths. In practically all cases the threads of the warp are separated mechanically into two layers, between which the shuttle is driven, and the latter leaves a trail of weft each journey from left to right and from right to left, the reversal of direction causing the weft to bend partially round the outermost thread at each side, in order to form the selvages of the cloth.

Cotton-finishing.—Each type of cloth requires its own particular method of finishing. The first operation is that of examining the cloth, and of removing slubs, lumps, or any foreign matter which may have been woven in or attached to the cloth. The latter may afterwards be singed to remove outstanding parts, then raised, cut, brushed, and steamed. A solution of starch may be required to load the fabric, in which case the fabric may pass through a starch-mangle, then guided over the rollers of the drying-machine, and on to the grips of the stentering-machine. Again, the fabric may be damped and then calendered, chested, chased, beetled, or schreinered.

Piece goods may be stamped or marked, measured, rolled, lapped, or

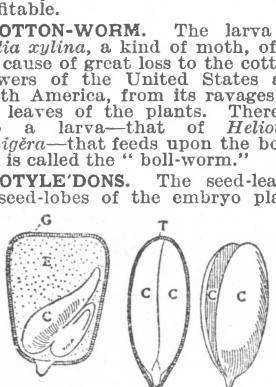
plaited, while wide cloths may be doubled lengthwise (termed *rigging*), and simultaneously rolled. Goods which are to be transformed into definite lengths or shapes for various garments, towels, and other articles, may be cut up by means of a band-saw, or by electric-cutters. These shaped articles may then be embroidered, hem-stitched, laundered, made up into boxes or parcels, and stored for future orders or dispatched immediately to their destination.

COTTON-SEED OIL. A useful oil expressed from the seeds of the cotton plant, often used as an adulterant or as a substitute for other oils. The oil-cake of cotton-seed is a valuable cattle-feeding substance.

COTTON-WOOD. A tree of the poplar kind, the *Populus monilifera*, a native of North America. The "cotton" from the seeds has been used in France and Germany for making cloth hats and paper, but the experiment was found unprofitable.

COTTON-WORM. The larva of *Aletia xylina*, a kind of moth, often the cause of great loss to the cotton-growers of the United States and South America, from its ravages on the leaves of the plants. There is also a larva—that of *Heliothis armigera*—that feeds upon the bolls, and is called the "boll-worm."

COTYLE'DONS. The seed-leaves or seed-lobes of the embryo plant,



Cotyledons

1, Maize (Monocotyledonous seed). 2, Apple (Dicotyledonous exalbuminous seed). 3, Embryo of Apple seed. 4, Embryo of Poppy seed. 5, Poppy (Dicotyledonous seed). 6, Embryo of Pine seed. 7, Pine (Polycotyledonous albuminous seed). C, Cotyledon. E, Endosperm. T, Seed-coat (testa). G, Grain-coat (testa+pericarp).

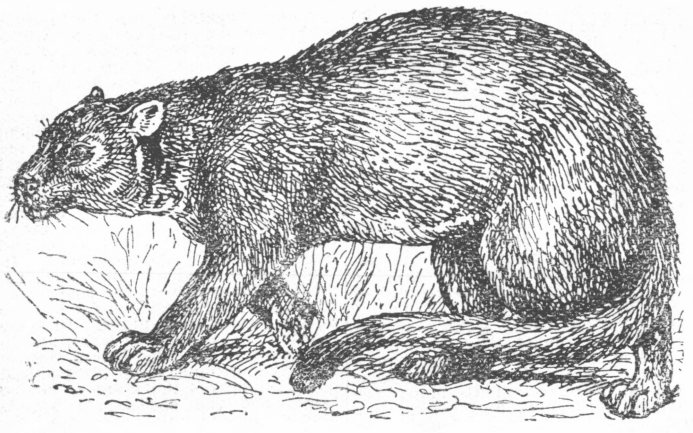
forming, together with the radicle and plumule, the embryo, which exists in every seed capable of germination. Some plants have only one cotyledon, and are accordingly termed *monocotyledonous*; others have two, and are *dicotyledonous*. These differences are accompanied by remarkable differences in the structure of the stems, leaves, and blossoms which form the basis for the division of flowering plants into two great classes. The embryo plant of the Coniferæ has many (three to twelve) cotyledons, and may be called *polycotyledonous*. In the seeds termed exalbuminous, i.e. devoid of endosperm, the cotyledons contain a supply of food for the use of the germinating plant. In some plants the store is very large, and in germination the seed-leaves remain under the ground, as in the pea and oak; in others the store is not so large, and the seed-leaves appear above ground and perform the functions of true leaves; while there is a large class of seeds where the embryo is very small, and the food is stored up around it, as in wheat and the buttercup.

COUCH (*Quitch*, or *Quick*) **GRASS** (*Triticum repens*). A perennial grass, which is propagated both by seed and by its creeping root-stock, and is one of the most common and troublesome weeds of agriculture. When it first appears above ground its blade is readily eaten by sheep. The roots are eaten by pigs, and when cleaned and boiled or steamed become a farinaceous and nutritious food for cows and horses. It is the grass eaten by dogs as a vomit.

COUCY kō-sē), **Châtelain de.** An old French poet. He is either Renaud, who was castellan of the castle from 1204 to 1218, or Guy de Coucy, castellan from 1186 to 1203. His songs are distinguished by great warmth of passion. He is the hero of a celebrated romance of the thirteenth century by Jakemon Sakesep.

COUÉ, Emile. French chemist, born at Troyes, 26th Feb., 1857, he became a chemist there. He devoted much time to studying how to cure illnesses by suggestion, his fundamental idea being that, if the patient believes himself to be getting better from an illness, he has taken an important step towards that end. Coué's ideas met with a good deal of success, and in 1910 he moved to Nancy, where he opened a clinic for their practice. He died at Nancy, 2nd July, 1926.

COUGAR (kō'gär), or **PUMA.** A quadruped of the cat kind, inhabiting most parts of America—*Felis concolor*.



Cougar

Its colour is a uniform fawn or reddish-brown, without spots or markings of any kind. It may attain a length of 9 feet, inclusive of the tail. In habits it is stealthy and cowardly, and seldom or never attacks man. It is by some called the panther or red tiger, and is one of the most destructive of all the animals of America, particularly in the warmer climates, where it carries off fowls, dogs, cats, and other domestic animals.

COUGH. A sudden and forcible expiration immediately preceded by closure of the glottis or narrowed portion of the box of the windpipe. The force for the action is obtained by a deep breath, then follows the closure of the glottis, succeeded by the expiratory effort forcing open the glottis. The action is performed by the expiratory muscles, that is, the abdominal muscles, by whose contraction the diaphragm is forced up, and the muscles of the chest, by which the ribs are pulled down. The cavity of the chest being thus diminished, air is driven out of the lungs. The object of the cough is usually to expel any foreign material in the lungs or air-tubes. The offending material may be there present as the result of inflammation or catarrh. It may also have gained entrance from without. Thus the irritating material may be merely some food or drink which has slipped into the larynx, or it may be dust in the air inhaled, and the cough is the means of expelling the intruder.

But a cough may also be produced when there is no irritating material present. The larynx or windpipe may be in an inflamed and irritable condition, in which state even the entrance of cold air will excite coughing. Moreover, cough may be produced by irritation of nerves, distant from the lungs and air-passages, by what is called reflex action. Thus irritation of the stomach, irritation connected with the ear, or irritation of certain nerves by pressure of growths, may produce cough when the respiratory organs are not directly affected at all. Irritation at the back of the throat, as of the tickling of a long uvula, and so on, also produces it. A catarrhal cough is generally considered unimportant, particularly if there be no fever connected with it. But every cough lasting longer than two or three days is suspicious, and ought to be medically treated.

COULISSE (kö-lis'). One of the side scenes of the stage in a theatre, or the space included between the side scenes; properly one of the grooved pieces of wood in which a flat scene moves. It is also a term of the Paris Bourse, derived from *coulisse*, or passage where transactions were carried on without the *agents de change*.

COULMIERS. A village in France, department of Loiret, 13 miles N.W. of Orléans. A battle was fought there between the French and the Germans on 9th Nov., 1870. Pop. 404.

COULOMB (kō-lōn), **Charles Augustin de.** French physicist, born 1736 at Angoulême, died 1806. His fame rests chiefly on his discoveries in electricity and magnetism, and on his invention of the torsion balance.

COUMARIN (kō′-). A vegetable proximate principle, obtained from the *Dipterix odorāta* or Tonka bean, sweet woodruff, sweet-scented vernal grass, and melilot. It has a pleasant aromatic odour, and a burning taste; and is used in perfumery, in medicine, and to give flavour to certain varieties of Swiss cheese.

COUNCIL (Lat. *concilium*). An assembly met for deliberation, or to give advice. The term specially applies to an assembly of the representatives of independent Churches, convened for deliberation and the enactment of canons or ecclesiastical laws. The four general or œcumenical councils recognized by all Churches are: (1) the Council of Nice, in 325, by which the dogma respecting the Son of God was settled; (2) that of Constantinople, 381, by which the doctrine concerning the Holy Ghost was decided; (3) that of Ephesus, 431; and (4) that of Chalcedon, 451; in which two last the doctrine of the union of the divine and human nature in Christ was more precisely determined.

Among the principal Latin councils are that of Clermont (1096), in the reign of Urban II., in which the first Crusade was resolved upon; the Council of Constance, the most numerous of all the councils, held in 1414, which pronounced the condemnation of John Huss (1415) and of Jerome of Prague (1416); the Council of Basel, in 1431, which intended a reformation, if not in the doctrines, yet in the constitution and discipline of the Church; and the Council of Trent, which began its session in 1545, and laboured chiefly to confirm the doctrines of the Catholic Church against the Protestants. On 8th Dec., 1869, an œcumenical council, summoned by a bull of Pope Pius IX., assembled at Rome. It lasted till 18th July, 1870, when it was adjourned. This council adopted a dogmatic Decree or *Constitutio de Fide*, and a *Constitutio de Ecclesia*, the most important article of which latter declares the infallibility of the Pope when speaking *ex cathedrâ*.—BIBLIOGRAPHY: W. P. du Bose, *The Œcumenical Councils*; T. H. Bindley, *The Œcumenical Documents of the Faith*.

COUNCIL, Aulic. *See* AULIC.

COUNCIL BLUFFS. A city and important manufacturing centre, United States, Pottawattamie County, Iowa, on the left bank of the Missouri, opposite Omaha city, with which it is connected by a bridge 2750 feet in length and 50 feet above high water. The name is derived from a council held here with the Indians in 1804. Pop. 36,162.

COUNSEL, or COUNSELLOR. A person retained by a client to plead his cause in a court of judicature. The term counsel is used as a plural for a number of legal counsellors engaged together in a case.—**King's** or **Queen's Counsel** are English barristers appointed counsel to the Crown, on the nomination of the Lord-Chancellor, and taking precedence over ordinary barristers. They have the privilege of wearing a silk gown as their professional robe, that of other barristers being of stuff.

COUNT (Lat. *comes, comitis*, a companion). Appears to have been first used, as a title of dignity, in the reign of the Roman Emperor Constantine (fourth century), meaning originally the companion of a prince or high dignitary. After the fall of the Roman power the title was retained; and under Charlemagne it denoted equally a military or civil employment. About the end of the fifteenth century, in Germany, and under the last princes of the Merovingian race in France, the title appears to have become hereditary in certain families. The German title *Graf* corresponds to the title *Count* in other countries of Europe. In modern times the custom of styling all the sons of a count also counts makes this designation very common on the Continent, and the rank little more than nominal.

COUNT. In law, an independent part of a declaration or indictment, which, if it stood alone, would constitute a ground of action.

COUNT AND RECKONING. In Scots law, a form of action by which a person liable to account to another for money in his hands, e.g. a trustee, may be forced to render full accounts showing the amount due.

COUN′TERFOIL. A kind of complementary and easily detached portion of a document, such as a bank cheque or draft, which is retained by the person giving the document, and on which is written a memorandum of the main particulars contained in the principal document.

COUNTER-IRRITANT. In medicine, is a substance employed to produce a pathological state of the skin in order to relieve some more deep-seated disturbance. This irrita-

tion of the skin may be produced by the action of drugs which cause blistering, e.g. turpentine, cantharides, mustard, etc., or by mechanical means, as in the application of the cautery and electrical currents, in cupping and in the use of setons (almost obsolete), or in the application of heat, moist or dry, in many different forms.

COUN'TERPOINT. In music, a term (originated in the fourteenth century) equivalent to harmony, or the writing of a carefully planned accompanying part; or that branch of the art which, a musical thought being given, teaches the development of it, by extension or embellishment, by transposition, repetition, or imitation throughout the different parts. Counterpoint is divided into *simple*, *florid* or *figurate*, and *double*.

Simple.—*Simple counterpoint* is a composition in two or more parts, the notes of each part being equal in value to those of the corresponding part or parts and concords.

Florid.—In *florid counterpoint*, two or more notes are written against each note of the subject, or *canto-fermo*, and discords are admissible.

Double.—*Double counterpoint* is an inversion of the parts, so that the base may become the subject, and the subject the base, etc., thus producing new melodies and new harmonies. The study of counterpoint received a new and wonderful development in the works of Handel and Bach.

COUN'TERSCARP. In fortification, the exterior talus or slope of the ditch, or the talus that supports the earth of the covered way. It often signifies the whole covered way, with its parapet and glacis.

COUN'TERTENOR. In music, one of the middle parts between the tenor and the treble; high tenor. It is the highest male adult voice, having its easy compass from tenor G to treble C, and music for it is written on the alto or C clef on the middle line of the staff. The lowest voices of females and boys have about the same register, and are sometimes inaccurately called countertenor. The correct term is *alto* or *contralto*.

COUNTESS. Title in the British peerage. Most of its holders are the wives of earls, but some are countesses in their own right. By customary law a Scottish earldom descends to a daughter if there are no sons; an English one only does so if such is laid down in the patent. In 1932 there were six countesses in their own right. *See* EARL.

COUNT-OUT. In the British House of Commons, the act of the Speaker when he counts the number of members present, and, not finding forty, intimates that there is not a quorum, when the sitting stands adjourned. The proceedings may be continued, however few be present, provided no member formally moves a count.

COUNT PALATINE. In England, formerly the superior of a county, who exercised regal prerogatives within his county, in virtue of which he had his own courts of law, appointed judges and law officers, and could pardon murders, treasons, and felonies. All writs and judicial processes proceeded in his name, while the king's writs were of no avail within the Palatinate. The Earl of Chester, the Bishop of Durham, and the Duke of Lancaster were the Counts Palatine of England, the corresponding counties being called *counties palatine*.

COUNTRY DANCE. A rustic dance of English origin, in which many couples can take part. The performers are arranged face to face, the gentlemen on one side and the ladies on the other, and go through certain prescribed figures. It was introduced into France in the eighteenth century, and was known as *Anglaise*. The French *contredanse* is a corruption of the English word, not the original form of it, as has been erroneously stated.

COUNTY. Originally a district of a country subject to a *count* or earl. It is now a civil division corresponding with *shire* in England and Scotland. Each British county has its Lord-Lieutenant, its sheriff, and its court or courts, with various officers employed in the administration of justice and the execution of the laws. The larger counties are more or less divided for purposes of parliamentary representation, and also for the more convenient administration of justice. The City of London is also a county by itself. The provinces of Canada are also divided into counties, as are the Australian colonies, and each of the United States. *See* SHIRE; LOCAL GOVERNMENT.

COUNTY BOROUGH. A town that forms practically a county, possessing the privilege of being governed by its own magistrates, irrespective of the county in which it is situated. *See* LOCAL GOVERNMENT.

COUNTY COUNCIL. *See* LOCAL GOVERNMENT.

COUNTY COURTS. An ancient institution in England. The new county courts were established in

1846, chiefly with the view of affording a speedy and cheap mode of recovering small debts. Their jurisdiction, which is now wide and varied, was extended by several subsequent statutes and is now governed by the County Courts Act, 1888, as amended by subsequent Acts of 1903, 1919, and 1924, the Judicature Consolidation Act, 1925, and various statutes, e.g. the Rent Restriction Acts, the Guardianship of Infants Act, 1925, The Workmen's Compensation Act, 1925, etc. These courts have jurisdiction in all actions for breach of contract or tort where the claim is for £100 or less, but certain actions, e.g. for breach of promise of marriage, seduction, libel, or slander, cannot be brought in these courts except with the consent of the parties. The jurisdiction of the court can be extended to claims of more than £100 if the parties consent.

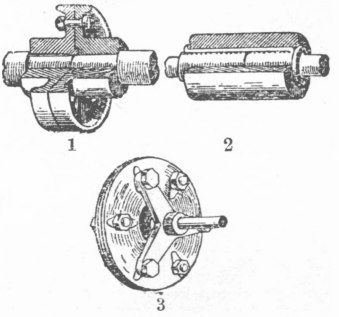
COUPAR-ANGUS. A police burgh, Scotland, formerly partly in Forfar, now all in Perthshire. Pop. (1931), 1883.

COUP D'ETAT. Sudden change of government forcibly effected by ruler, army or populace. French examples occurred when Napoleon I. suppressed the Directory, 9th Nov., 1799, and Louis Napoleon, Prince-President, broke up the National Assembly, 2nd Dec., 1851. Similar changes have characterized modern revolutions in Brazil, Germany, Portugal, Russia, Serbia, Spain, and Spanish America.

COUPLE. In mechanics, two equal and parallel forces acting in opposite directions on the same body. A couple has a constant turning moment or *torque* which is measured by the product of one of the equal forces and the perpendicular distance between them (called the *arm*).

COUPLET. A pair of lines of verse closely welded together, usually by rhyme. The elegiac couplet, consisting of hexameter and pentameter, is perhaps the most celebrated metre of the ancient world, and was used by many Greek poets, and by Catullus, Tibullus, Propertius, and Ovid among the Romans. The heroic couplet was used with much skill by Chaucer, and was very largely employed by Pope and Dryden. Elizabethan and Jacobean dramatists frequently end a scene with a couplet, which forms a sort of tag. Detached couplets are usually aphorisms, such as the distichs of Dionysius Cato.

COUPLING. In machinery, a contrivance for connecting one portion of a system of shafting with another, of which there are various forms. A common form is the flange or plate coupling, which consists of two flanges separately fitted on to the two contiguous ends of the lengths of shaft to be connected, and firmly secured together by screws. The most useful kinds of couplings are those that are adjustable. or can be



Couplings

1, Flange coupling, shown partly in section. 2, Box of Muff coupling shown partly in section. 3, Flexible coupling.

readily put on and off. Couplings are also constructed so that, while rigid as regards twisting, they are flexible as regards bending, and so are called "flexible couplings."—The term is also applied to an organ register, by which two or more rows of keys can be connected by a mechanism, so that they can be played together.

COUPON (kŏ'pon; from Fr. *couper*, to cut). An interest-certificate printed at the bottom of transferable bonds, and so called because it is cut off or detached and given up when a payment is made. Also one of a series of tickets which binds the issuer to make certain payments, perform some service, or give value for certain amounts at different periods, in consideration of money received. Coupons for butter, sugar, and meat played a prominent part in the domestic economy of the European War and after.

COURBEVOIE (körb-vwä). A town of France, department of Seine, on the left bank of the Seine, 5 miles N.W. of Paris, of which it now forms a suburb. Pop. 54,185.

COURCELLES (kör-sāl). A village of Alsace-Lorraine, 4 miles S.E. of Metz; scene of a German victory over the French under Bazaine, 14th Aug., 1870.

COURIER. A bearer of special dispatches, whether public or private; also an attendant on a party travelling abroad, whose especial duty is to make all arrangements at hotels and on the journey.

COURLAND (Ger. *Kurland*). One of the Baltic provinces, bounded north by Livonia and the Gulf of Riga, west by the Baltic, south by Kovno, and east by Vitebsk; area, 10,435 sq. miles; pop. 812,300. The largest city is Libau, with a population before the European War of about 90,000. In the neighbourhood of Mittau, the capital, the surface is diversified by hills of very moderate height; but elsewhere, and particularly towards the coast, it is flat, and contains extensive sandy tracts, often covered with heaths and morasses. About two-fifths of the whole of Courland are occupied by wood.

The peasantry are for the most part Letts; the more wealthy and intelligent classes Teutons; the prevailing religion being Lutheran. The territory was subjected to Poland in 1561, conquered by Charles XII. of Sweden in 1701, and was merged in Russia 1795. In 1917 Courland proclaimed its independence, but in 1919 became part of Latvia. Lithuania disputed this, but by the Riga Agreement of 1920 almost the whole of Courland remained in Latvia.

COURSER, or **COURIER** (Cursorius). A genus of the family Glareolidæ, including birds related to the plovers. They are found chiefly in Africa, but one species, the cream-coloured courser (*Cursorius gallicus*), has been met with in Britain.

COURSING. A kind of sport in which hares are hunted by greyhounds, which follow the game by sight instead of by scent. Meetings are held in various localities, at which dogs are entered for different stakes, as horses are at a race-meeting. When a hare is started, it is allowed a certain advance on the dogs, which are then let loose from the "slips" or cords held by the "slipper" and fastened to the dogs' collars. A judge keeps his eyes on the dogs, and notes what are called "points," the victory being adjudged to the dog which makes the most "points."—BIBLIOGRAPHY: T. Thacker, *Courser's Companion and Breeder's Guide*; H. Cox, C. Richardson, and Hon. G. Lascelles, *Coursing and Falconry* (Badminton Library).

COURT. (1) All the surroundings of a sovereign in his regal state; the body of persons who compose the household of, or attend on, a sovereign. *Presentation at Court* is a formal introduction of persons of some eminence or social standing to the British sovereign on certain State occasions appointed for the purpose. They have to appear in the regulation "court dress." (2). A tribunal of justice; the hall, chamber, or place where justice is administered, or the persons (judges) assembled for hearing and deciding causes, civil, criminal, military, naval, or ecclesiastical.

Courts may be classified in various ways. A common distinction is into *courts of record* and *not of record*; the first being those the judicial proceedings of which are enrolled in records. They may also be divided into courts of *original jurisdiction* and courts of *appeal*, or of *appellate jurisdiction*, *inferior* and *superior* courts, etc. Articles on the different courts will be found under such separate headings as ADMIRALTY COURT; APPEAL, COURT OF; ARCHES; CHANCERY; COMMON PLEAS; DIVORCE; EQUITY; EXCHEQUER; JUSTICIARY; and SESSION, COURT OF.

COURTAULD. English family. Its founder was George Courtauld, an American who began business as a silk thrower at Braintree in Essex. The business grew under the direction of his son Samuel, and the firm of S. Courtauld & Co. became known as manufacturers of crêpe. Samuel Courtauld died 21st March, 1881, and his descendants have since controlled the business. In the twentieth century the firm added artificial silk to its activities, and soon became much the largest producer in the country. Known as Courtauld's Ltd., it became a limited company in 1913, and has factories in Manchester, Coventry, Braintree, and elsewhere, as well as large interests in the United States and other foreign countries.

COURT-BARON. In England, a court composed of the freeholders of a manor, presided over by the lord of the manor or his steward. These courts have long fallen into disuse.

COURT DE GÉBELIN (kōr-d-zhā-blan), **Antoine.** French writer, born in 1728, died in 1784. He published, in about 1774, *Le Monde Primitif Analysé et Comparé avec le Monde Moderne*, which, after nine volumes had appeared, remained unfinished. Its vast plan embraces dissertations on mythology, grammar, origin of language, and history.

COURTESY, Tenure by. In law, is where a man marries a woman solely seized of an estate of inheritance, and has by her, issue born alive capable

of inheriting her estate. In this case on the death of his wife he holds the lands for his life as tenant by courtesy. Tenancy by courtesy still exists in only a few cases, e.g. if the wife died intestate before 1926.

COURTESY TITLE. A title assumed by an individual or given to him by popular consent, to which he has no valid claim. When a British nobleman has several titles, it is usual to give one of his inferior titles to his eldest son. Thus the eldest son of the Duke of Bedford is *Marquess* of Tavistock, and the Duke of Buccleuch's eldest son is *Earl* of Dalkeith. The younger sons of a duke or marquess have the courtesy title of *Lord*, followed by their Christian and surname, as *Lord* William Lennox. The daughters of dukes, marquesses, and earls have the courtesy title of *Lady*, as *Lady* Mary Hamilton. The younger sons of earls, and all the children of viscounts and barons, are known as the Honourable A— B— (Christian and surname). In Scotland, the eldest son of a viscount or baron has often the courtesy title of *Master*, as the *Master* of Lovat, eldest son of Lord Lovat.

COURT LEET. A local customary court of great antiquity in England. It had a limited criminal jurisdiction, but any lord of a manor had a right to hold a court leet. The leet, however, was not properly speaking a manorial court, as there were town leets, borough leets, and hundred leets. The court has now been superseded by the police and county courts, but court leets are still occasionally held before the stewards of certain manors.

COURT-MARTIAL. The name given to the tribunal which is authorized by law to investigate and, if necessary, punish military offences committed by persons subject to military law. The suffix "martial" is misleading, tending as it does to the assumption that the law administered by such a court is martial law, between which and military law there is a vast difference. Speaking very generally, martial law may be defined as the will of the authority in possession, while military law is a recognized and legal code to which officers and soldiers of all ranks are subject. The term court-martial was first used in the latter part of the seventeenth century, supplanting the earlier court of war and the still earlier Court of the Constable.

The present-day courts-martial are of two degrees (with the addition of a third on active service, and in certain cases abroad, when not on active service). The two ordinary courts are the general and the district court-martial. These differ (*a*) as to the legal minimum of members; (*b*) in the punishment awardable; (*c*) as to the ranks of the persons they are competent to try. A general court-martial at home and in India must consist of at least nine members, while a district court-martial need not have more than three. A general court-martial can award any punishment authorized by the Army Act; a district court-martial cannot award more than two years' imprisonment. A general court-martial can try any officer or soldier subject to military law; a district court-martial cannot try an officer, and can only sentence a warrant-officer to certain specified punishments.

The special court-martial authorized for use on active service, when an ordinary general court-martial cannot be assembled, is known as a "Field General Court-martial." It will usually consist of a president and two members, and has the same powers as a general court-martial, i.e. it can try any person subject to military law, and can award any punishment authorized by the Army Act. In procedure it differs radically from an ordinary court-martial in that it is not obliged to take down the whole evidence in writing.

Every court-martial is an open court, though it may be cleared at any time for deliberation, and must be cleared to consider the finding. Presidents and members of any court-martial must be officers subject to military law, and such a court can only try persons subject to the same law. A prosecutor must be appointed to every court-martial; the duties of this officer differ considerably from those of a prosecuting counsel in an ordinary criminal court, in that his duties are to ascertain the truth, and not merely to obtain a conviction. — BIBLIOGRAPHY: Simmons, *On the Constitution and Practice of Courts-martial*; J. M. Lowry, *Military Law within the Realm of England*; E. S. Dudley, *Military Law and the Procedure of Courts-martial*.

COURT OF SESSION. *See* SESSION, COURT OF.

COURT-PLASTER (so called because originally applied by ladies of the court as patches on the face). Black, flesh-coloured, or transparent silk varnished over with a solution of isinglass, which is often perfumed with benzoin, used for covering slight wounds.

COURTRAI (kör-trā; Fl. *Kortryk*). A fortified town, Belgium, province

of West Flanders, 26 miles S. of Bruges, on the Lys. It dates back to Roman times, when it was called *Cortoriacum*. It is well built, having handsome and spacious streets, and a fine Grande Place, with several other squares. Its manufactures are table-linens, lace (which is celebrated), cambrics, and cotton goods, and it has extensive bleaching- and dyeing-works. Here, in 1302, took place the "Battle of Spurs" between the French and Flemings. Pop. (1930), 38,740.

COURTS OF LOVE. In the chivalric period of the Middle Ages, courts composed of knights, poets, and ladies, who discussed and gave decisions on subtle questions of love and gallantry. The first of these courts was probably established in Provence about the twelfth century. There was a code called *De Arte Amatoria et Reprobatione Amoris*, upon which the decisions of the tribunals are said to have been based. They reached their highest splendour in France, under Charles VI., through the influence of his consort Isabella of Bavaria, whose court was established in 1380. An attempted revival was made under Louis XIV. by Cardinal Richelieu.

COUSIN (kö-zaṇ), **Victor.** French philosopher and writer, founder of the so-called Eclectic school of philosophy, was born at Paris 1792, died at Cannes 1867. He was educated at the Lycée Charlemagne, and entered the École Normale, then newly instituted, in 1811. His mind was directed towards philosophy under Laromiguière, Royer-Collard, and Maine de Biran. In 1815 Royer-Collard, returning to political life, recommended Victor Cousin as his successor, and he became deputy-professor of philosophy at the Sorbonne. He had also an appointment at the Lycée Napoléon, or Collège Henri IV., and at the École Normale. In the free discussions (*conférences*) which followed his prelections, he became by the influence his eloquence exercised over his pupils the founder of a school which, while assuming an eclectical development, was originally based on the dogmatic teaching of the Scottish school.

In 1817 he visited Germany, and became acquainted with the writings of Kant, Fichte, Jacobi, and Schelling, by whose opinions his own were henceforth modified. He lost his position as public teacher on political grounds in 1822, and did not resume teaching till 1828, when he shared with Guizot and Villemain an unexampled popularity, due partly to political feeling. After the July revolution (1830) he entered the Council of Public Instruction, to which he presented valuable reports on the state of public education in Germany and Holland. In the Cabinet of Thiers in 1840 he accepted the office of Minister of Public Instruction, and was created a peer of France. The revolution of 1848 brought his public career to a close.

The head and founder of the modern school of eclecticism in France, he borrowed from many sources. His eclecticism was based on the principle that every system, however erroneous, which has anywhere commanded assent, contains some elements of truth, by which its acceptance may be explained, and that it is the business of philosophical criticism to discover and combine these scattered elements of truth. The following are among his works: *Fragments Philosophiques* (1826); *Nouveaux Fragments Philosophiques* (1828); *Cours de Philosophie Morale* (1840-41); *Cours de l'Histoire de la Philosophie* (1828); *Histoire de la Philosophie au dix-huitième Siècle* (1829); *De la Métaphysique d'Aristote* (1838); *Philosophie Scolastique* (1840); *Du Vrai, du Beau et du Bien* (1854); etc.—BIBLIOGRAPHY: H. Taine, *Les Philosophes*; P. Janet, *Victor Cousin et son œuvre*; J. Barthélemy Saint-Hilaire, *Victor Cousin: sa vie et correspondance*.

COUSINS, Samuel. English engraver, born 1801, died 1887. He engraved plates after Lawrence, Landseer, Reynolds, Millais, Leslie, Eastlake, and Ward. He was elected a Royal Academician Engraver in 1855, and when this class was abolished he became an Academician proper. A large collection of his mezzotints is in the British Museum.

COUTANCES (kö-tāṇs). A town, Northern France, department of Manche, on a hill about 4 miles from the sea, with which it communicates by a canal. It has a fine old cathedral crowning the hill on which the town stands. Pop. about 7000.

COUTHON (kö-tōṇ), **Georges.** A noted French revolutionist, born in 1755, and bred to the profession of a lawyer. Some time after the Revolution—in 1791—he was chosen a member of the National Assembly, and allying himself with Robespierre aided and abetted the latter in all his atrocities. On the downfall of Robespierre's party Couthon shared, along with him and St. Just, in the decree of arrest, and was guillotined, 28th July, 1794.

COUTTS (kŏts), **Thomas.** London banker, born 1735, died 1822. Son

of an Edinburgh provost, he early went to London, engaged with his brother in banking, and amassed an immense fortune. He married, as his second wife, Harriet Mellon, the actress, and at his death left her all his property. She afterwards married the Duke of St. Albans, and at her death the bulk of her property passed to Miss Burdett-Coutts, granddaughter of her first husband.

COUVADE (kö-väd′; from Fr. *couver*, to hatch). A singular custom prevalent in ancient as well as modern times among some of the primitive races in all parts of the world. After the birth of a child the father takes to bed, and receives the food and compliments usually given elsewhere to the mother. The custom was observed, according to Diodorus, among the Corsicans; and Strabo notices it among the Spanish Basques, by whom, as well as by the Gascons, it is still to some extent practised. Travellers from Marco Polo downwards have met with a somewhat similar custom among the Chinese, the Dyaks of Borneo, and the negroes. The custom of the couvade has been observed in its most typical form in South America and the West Indies. — BIBLIOGRAPHY: Lord Avebury, *Origin of Civilization*; W. Z. Ripley, *The Races of Europe*.

COV'ENANT. In law, an agreement between two or more parties in writing signed, sealed, and delivered, whereby they agree to do, or not to do, some specified act. There seems to be some doubt whether a signature is strictly necessary in all cases. It is clearly necessary in all deeds executed after 1925.

COVENANT. In Scottish history, the name given to a bond or oath drawn up by the Scottish reformers, and signed in 1557, and to the similar document or Confession of Faith drawn up in 1581, in which all the errors of Popery were explicitly abjured. The latter was subscribed by James VI. and his council, and all his subjects were required to attach their subscription to it. It was again subscribed in 1590 and 1596. The subscription was renewed in 1638, and the subscribers engaged by oath to maintain religion in the same state as it was in 1580, and to reject all innovations introduced since that time. —**The Solemn League and Covenant** was a solemn contract entered into between the General Assembly of the Church of Scotland and commissioners from the English Parliament in 1643, having for its object a uniformity of doctrine, worship, and discipline throughout Scotland, England, and Ireland, according to the word of God and the example of the best reformed Churches. In 1662 it was abjured by Act of Parliament, both in England and Scotland.— **The Ulster Covenant** was a solemn declaration signed by 218,206 loyalists of Ulster on 28th Sept., 1912 ("Ulster Day"), wherein they pledged themselves to stand by each other in defence of their rights, to use all means which might be found necessary to defeat the Home Rule Bill, and to refuse to recognize the authority of a Dublin Parliament. A similar document was signed by 20,000 men in Great Britain and the other three provinces of Ireland.

COVENAN'TERS. In Scottish history, the name given to the party which struggled for religious liberty from 1637 on to the revolution; but more especially applied to the insurgents who, after the passing of the Act of 1662 denouncing the Solemn League and Covenant as a seditious oath (*see* COVENANT), took up arms in defence of the Presbyterian form of Church government. The Presbyterian ministers who refused to acknowledge the bishops were ejected from their parishes and gathered round them crowds of their people on the hillsides, or any lonely spot, to attend their ministrations. These meetings, called "conventicles," were denounced as seditious, and to frequent them or to hold communication with those frequenting them was forbidden on pain of death. The unwarrantable severity with which the recusants were treated provoked them to take up arms in defence of their opinions. The first outbreaks took place in the hill country on the borders of Ayr and Lanark shires. Here at Drumclog, a farm near Loudon Hill, a conventicle was attacked by a body of dragoons under Graham of Claverhouse, but were successful in defeating their assailants (1679). The murder of Archbishop Sharp on Magus Moor, and this defeat, alarmed the Government, who sent a large body of troops under the command of the Duke of Monmouth to put down the insurgents, who had increased in number rapidly. The two armies met at Bothwell Brig, where the Covenanters were totally defeated (22nd June, 1679).

In consequence of the rebellious protest called the *Sanquhar Declaration*, put forth in 1680 by Cameron, Cargill, and others, as representing the more irreconcilable of the Covenanters (known as Cameronians), and a subsequent proclamation in 1684, the Government proceeded to more severe measures. An oath was now required of all who would free themselves of

suspicion of complicity with the Covenanters; and the dragoons who were sent out to hunt down the rebels were empowered to kill any one who refused to take the oath. During this "killing time," as it was called, the sufferings of the Covenanters were extreme; but notwithstanding the great numbers who were put to death, their fanatic spirit seemed only to grow stronger. Even after the accession of William some of the extreme Covenanters refused to acknowledge him owing to his acceptance of Episcopacy in England, and formed the earliest dissenting sect in Scotland. *See* CAMERON, RICHARD; SCOTLAND (RELIGIOUS STRUGGLES). — BIBLIOGRAPHY: A. Lang, *History of Scotland*; J. K. Hewison, *The Covenanters*; J. P. Thomson, *The Scottish Covenanters*, 1637-1688.

COVENT GARDEN (that is, *convent* garden). A market-place in London, which formerly consisted of the garden belonging to the abbot and monks of Westminster. In 1831 the present market buildings were erected by the Duke of Bedford, then proprietor of the ground. The Covent Garden estate was purchased in 1913 by Mr. Mallaby-Deeley, who sold it again in 1914 to Sir Joseph Beecham. In 1920 the estate was sold to Edgar Creyke-Fairweather of Arundel.— **Covent Garden Theatre** (1858) sprang out of one in Lincoln's-Inn-Fields, through a patent granted to Sir W. Davenant in 1662. It is associated with the names of Kemble, Siddons, and Macready. Earlier theatres built on this site were burnt in 1809 and 1856.

COV'ENTRY. A city and county borough in Warwick, England, 90¾ miles N.W. of London. It was formerly surrounded by lofty walls and had twelve gates, and was the see of a bishop early conjoined with Lichfield. Parliaments were convened here by the earlier monarchs of England, several of whom occasionally resided in the place. Pageants and processions were celebrated in old times with great magnificence, and a remnant of these still exists in the processional show in honour of Lady Godiva. There are still a few narrow and irregular streets, lined with houses in the style of the fifteenth and sixteenth centuries. There are several fine churches. Coventry is the centre of the ribbon trade, and manufactures also silk fabrics, cambric frilling, cottons, watches, machinery, and bicycles. It sends one member to Parliament. Pop. (1931), 167,046.

COV'ERDALE, Miles. The earliest translator of the Bible into English, was born in Yorkshire in 1488, died 1568. He was educated at Cambridge, and was ordained priest in 1514. Some years afterwards he was led to embrace the reformed doctrines, and, having gone abroad, assisted Tyndale in his translation of the Bible. In 1535 his own translation of the Scriptures appeared, with a dedication to Henry VIII. Coverdale was almoner to Queen Catherine Parr, and officiated at her funeral. In 1551, during the reign of Edward VI., he was appointed Bishop of Exeter, but was ejected on the accession of Mary, and thrown into prison. After two years' confinement he was liberated, and proceeded first to Denmark, and subsequently to Geneva, where he was employed in preparing the Geneva translation of the Scriptures. On the accession of Elizabeth he returned to England, and held for a short time the rectory of St. Magnus, London Bridge. Coverdale's works and letters were published by the Parker Society in 1846.

COVERED WAY. A space of ground on the edge of the ditch round the works of a fortification between the counterscarp and the glacis, affording a safe communication round all the works.

COVERLEY, Sir Roger de. An old English dance, so called from the tune used during its performance. The tune is supposed to be Scottish, and north of the Tweed it is known as the *Mautman comes on Monday*. The tune is called *Roger of Coverley*, or *Sir Roger de Coverley*. Joseph Addison took the name for his Sir Roger in the *Spectator*.

COV'ERTURE. A legal term applied to the position of a woman during marriage, because she is under the cover or protection of her husband.

COVILHA (ko-vil'yá). A town, Portugal, province of Beira, on the south-east slope of the Serra da Estrella. In the neighbourhood there are noted sulphurous baths. Pop. 14,049.

COV'INGTON. A city of Kentucky, United States, on the south bank of the Ohio River, opposite Cincinnati, of which it is substantially a suburb, connected by means of bridges and ferries. It has a large general trade and manufacturing business. Pop. 65,652.

COW. The general term applied to the females of the genus Bos or ox, the most valuable to man of all the ruminating animals. The best British dairy breeds are the Shorthorn, Longhorn, Ayrshire, South Devon, Jersey, Guernsey, Red Poll, Kerry, and Dexter. *See* CATTLE.

COWAL. Mountainous district in Argyllshire, Scotland. Bounded by Loch Long and the Firth of Clyde and by Loch Fyne, it is 40 miles long and 14 miles broad, and encloses Lochs Esk and Goil. It is a favourite holiday resort, containing the town of Dunoon.

COWARD, Noel. British dramatist. Born at Teddington, 16th Dec., 1899, he was educated privately. In 1910 he first appeared on the stage. Later he began to write and in a few years was regarded as one of the foremost of English dramatists. Among his plays are *I'll Leave it to You*, *The Young Idea*, *Easy Virtue*, *Home Chat*, *Sirocco*, *Bitter Sweet*, and *Cavalcade*.

COWBANE, or WATER-HEMLOCK (*Cicuta virōsa*). A perennial, umbelliferous, aquatic plant, producing an erect, hollow, much-branched,

Cowbane or Water Hemlock (*Cicuta virosa*)
1, Flower. 2, Fruit. 3, Section of fruit.

striated stem, 3 or 4 feet high, furnished with dissected leaves. It is highly poisonous. Sheep and goats are, however, not affected by the cowbane poison.

COW-BERRY. The *Vaccinium Vitis idæa*, red whortleberry, a procumbent shrub of high moorlands in Europe, Asia, and North America, has evergreen box-like leaves, and produces a red acid berry closely resembling cranberries, and used for jellies and preserves.

COW-BIRD. A name applied to the species of the genus Molothrus, which has a wide range through America, and is included in the passerine family Icteridæ. The North American species, *M. pecoris*, is about the size of a sky-lark. It drops its eggs into the nests of other birds to be hatched by them, but has never been known to drop more than one egg into the same nest. It is migratory, spending its winters regularly in the lower parts of North and South Carolina and Georgia, and appearing in Pennsylvania about the end of March. These birds often accompany cattle, hence their name.

COWBRIDGE. A small but ancient municipal borough (joined with Cardiff) of Wales, 12½ miles W. of Cardiff. Pop. (1931), 1018.

COWDENBEATH. A police burgh of Scotland, in Fifeshire, 6 miles N.E. of Dunfermline; inhabitants chiefly connected with coal-mines. Pop. (1931), 12,731.

COWDRAY, Weetman Dickinson Pearson. First Viscount, British contractor and politician, born 1856, died 1927. Entering business, he became head of the contracting firm of S. Pearson & Son, Ltd., and superintended the construction of the Dover Harbour Works and the Blackwall Tunnel. He sat in Parliament for Colchester from 1895 to 1910, when he was raised to the Peerage. In 1917 he was created a viscount and appointed Chairman of the Air Board, but resigned in November of the same year.

COWELL (kou'el), **Dr. John.** Jurist, born 1554, died 1611. Author of a law dictionary (*The Interpreter*), and *Institutiones Juris Anglicani*.

COWEN (kou'en), **Sir Frederic Hymen.** Musical composer and conductor, born at Kingston, Jamaica, 1852, educated at London, Leipzig, Berlin; Mus.Doc. of Cambridge, 1900. Chief works: *Rose Maiden*, a cantata (1870); *The Maid of Orleans* (1871); *The Corsair* (1874); *St. Ursula*, cantata (1881); *The Deluge*, oratorio; *Pauline*, opera; *Sleeping Beauty*, cantata (1885); *Ruth*, oratorio (1887); *Thorgrim*, opera (1890); *Signa*, opera (1892); *The Water-Lily*, cantata (1893); *Harold*, opera (1895); *Coronation Ode* (1902); *John Gilpin*, cantata (1904); *The Veil* (1910). In 1913 he published his memoirs under the title *My Art and My Friends*. He has also written overtures and many well-known songs. He was knighted in 1911.

COWES (kouz), **West.** A seaport town and watering-place, England,

north coast of the Isle of Wight, at the mouth of the River Medina. It is well known as a yachting port. Pop. (1931), 10,179.—**East Cowes**, on the opposite side of the river, is connected with it by a steam-ferry and floating-bridge. Pop. (1931), 4595.

COW'ITCH, or **COWHAGE** (Hind. *kawanch*). The hairs of the pods of leguminous plants, genus Mucūna, natives of the East and West Indies. The pod is covered with a thick coating of short, stiff, brittle, brown hairs, the points of which are finely serrated. They easily penetrate the skin, and produce an intolerable itching. They are employed medicinally (being taken in honey or syrup) as a mechanical vermifuge.

COWLEY (kou'li), **Abraham.** An English poet of great celebrity in his day, was born at London in 1618, died 1667. He published his first volume, *Poetical Blossoms*, at the age of fifteen. He entered Trinity College, Cambridge, in 1636, but was ejected as a Royalist in 1643, and removed to St. John's College, Oxford. He engaged actively in the Royal cause, and when the queen was obliged to quit England, Cowley accompanied her. He was absent from his native country nearly ten years, and it was principally through him that the correspondence was maintained between the king and queen. On the Restoration he returned with the other Royalists and obtained the lease of a farm at Chertsey, held under the queen, from which his income was about £300 per annum.

Cowley's poems have failed to maintain their former popularity, but he still holds a certain position as a prose writer and as an essayist. He took a considerable interest in science, and his pamphlet on *The Advancement of Experimental Philosophy* led directly to the foundation of the Royal Society. His chief works are: *Love's Riddle*, a pastoral comedy; *Davideis*, a scriptural epic; *Naufragium Joculare*; *The Mistress*, a collection of love verses; *Pindarique Odes*; and *Liber Plantarum*. The best edition of his works is that of A. B. Grosart, printed for the Chertsey Worthies Library.

COWLOON', or **KOWLOON.** A peninsula at the mouth of the Canton River, directly opposite to the Island of Hong-Kong, to which Crown colony it belongs.

COW-PARSNIP. An umbelliferous plant, genus Heracleum, one species of which, *H. sphondylium*, found in moist woods and meadows in England, grows to the height of 4 or 5 feet, and is used to feed pigs. A Caucasian cow-parsnip (*H. pubescens*) is grown in gardens and shrubberies, reaching the height of 10 or 12 feet *H. lanātum* is a common United States species.

COW-PEA, or **COW-GRASS** (*Trifolium medium*). A variety of clover cultivated in England for the same purpose as the common red (*T. pretense*).

COWPEN. A former urban district of England, in Northumberland, closely connected with the town of Blyth, of which it may be said to form part.

COWPER (kō'pėr), **William.** English poet, born at Berkhampstead in

William Cowper

1731, died at East Dereham, in Norfolk, 1800. He was the son of a clergyman; lost his mother at the age of six, and was, when ten years of age, removed from a country school to that of Westminster, which he left at eighteen with a fair reputation for classical learning, and a horror of the school discipline, which he afterwards expressed in his *Tirocinium*. He was then articled for three years to a solicitor, where he had for a fellow-clerk the future Lord-Chancellor Thurlow.

At the expiration of his apprenticeship he took chambers in the Middle Temple, and in 1754 was called to the Bar. The interest of his family procured for him the post of clerk to the House of Lords; but having to appear for examination at the bar of the House, his nervousness

was such that on the very day appointed for the examination he resigned the office, and soon after became insane. From Dec., 1763, to June, 1765, he remained under the care of Dr. Cotton at St. Albans. The skill and humanity of that gentleman restored him to health, and he retired to Huntingdon. Here he made the acquaintance of the Rev. Mr. and Mrs. Unwin, whose kindness, particularly that of the latter, seemed to have the most soothing and beneficial influence on him.

On the death of Mr. Unwin, in 1767, he removed with Mrs. Unwin to Olney, the residence of the Rev. John Newton, who also became an intimate friend and exercised a powerful influence over his mind and conduct. Newton had resolved on publishing a volume of hymns, and secured the co-operation of Cowper in composing them, but before their publication in 1776 he had been again attacked by his constitutional malady, by which, for ten years from 1773, his mind, with occasional intervals of recovery, was continually clouded. In 1776, by Mrs. Unwin's advice, he commenced a poem on the *Progress of Error*, which he followed by three other poems, *Truth*, *Table-talk*, and *Expostulation*; these with some others were published in a volume in 1782. Another of his friends, Lady Austen, suggested *The Task*, which, together with *Tirocinium*, formed a second volume in 1785. *The History of John Gilpin* is also due to the suggestion of Lady Austen. The translation of Homer, begun in 1784, occupied him for the next six years, and was published in 1791. He removed during its progress, in 1786, from Olney to Weston.

In the beginning of 1794 he was again attacked with madness, which was aggravated by the death of Mrs. Unwin in 1796. The revision of his Homer, and the composition of some short pieces, occupied the latter years of his life. He is considered among the best of our descriptive poets, and is one of the most easy and elegant of letter-writers. He and Burns brought back nature to English poetry. — BIBLIOGRAPHY: Robert Southey, *Life and Letters* (15 vols.); Goldwin Smith, *William Cowper* (in English Men of Letters Series); John Neave, *A Concordance to the Poetic Works of William Cowper*.

COWPER-TEMPLE CLAUSE. A clause inserted in the English Education Act of 1870, on an amendment by W. F. Cowper-Temple (1811-88) afterwards Lord Mount-Temple, to exclude from all rate-built schools every catechism and formula distinctive of any denominational creed.

COW-POX. The vaccine disease which appears on the teats of the cow, in the form of vesicles of a blue colour approaching to livid. These vesicles are elevated at the margin and depressed at the centre; they are surrounded with inflammation and contain a limpid fluid. This fluid or virus is capable of communicating genuine cow-pox to the human subject, and of protecting against small-pox either completely, or, at least, against the virulent form of the disease. *See* VACCINATION.

COWRIE-SHELL. A small gasteropodous shell, the *Cypræa monēta*, used for coin in some parts of Africa and in many parts of Southern Asia. The beauty of the cowrie-shells has procured them a place among ornaments, and they have been in demand among civilized and uncivilized nations time out of memory. The shells used as currency occur principally in the Philippine Islands. They vary in value in different localities. In India 6000 to 7000 are equal to a rupee, while in the interior of Africa 200 are worth 8*d*. The name is also given to other shells of the genus Cypræa.

COW'SLIP. The popular name of several varieties of *Primūla veris*, ord. Primulaceæ, a favourite wild flower found in pastures and hedge-banks in Britain. It has umbels of small, buff-yellow, scented flowers on short pedicels. Its flowers possess sedative properties, and have been used as an anodyne, a sort of wine being prepared from them.

COW-TREES. A name of various trees having an abundance of milky juice, especially of *Brosimum Galactodendron*, a South American tree, ord. Moraceæ (bread-fruits), which, when wounded, yields a rich milky, nutritious juice in such abundance as to render it an important article of food. This fluid resembles in appearance and quality the milk of the cow. The tree is common in Venezuela, growing to the height of 100 feet. The leaves are leathery, about 1 foot long and 3 or 4 inches broad. In British Guiana the name is given to the Hya-hya (*Tabernæmontāna utilis*), a large, much-branched tree belonging to the Apocynaceæ; in the country of the Rio Negro to Collophŏra, a tree of the same family; and in Pará to a species of Mimūsops.

COW-WHEAT. The name of plants of the genus Melampyrum, ord. Scrophulariaceæ, annuals, with

opposite narrow leaves, yellow or pinkish flowers, and a two-celled capsule containing a few seeds. They grow in woods, cornfields, and pastures, and are parasitic on the roots of other plants. Four species are found in Britain. They are excellent food for cattle.

COX, David. An English landscape painter, born in 1783 at Birmingham, died at Harborne, near Birmingham, 1859. He was apprenticed to a locket and miniature painter, for several years was engaged as scene painter, and in early life had to teach his art for a subsistence, at first living in London or in its neighbourhood. From 1813 to 1826 he was resident at Hereford, teaching and working, and while here he published several books for young artists, and contributed to the exhibitions of the Society of Painters in Water-colours. In 1827 he removed to London, where he took up painting in oils, under the influence of the painter W. Müller. In 1841 he returned to Birmingham, and to the rest of his life belong his greatest paintings, both in water-colours and in oils. His works are chiefly English landscapes, and his pictures are now very highly valued. Among some that have brought high prices are : *The Vale of Clwyd, Peace and War, Going to the Hayfield, Going to Market, The Skylark, The Church at Bettws-y-Coed, The Sea-shore at Rhyl.* Cox ranks with Constable and a few others as among the greatest English landscape painters of the earlier period. The best of his work is in the Birmingham Art Gallery, but the British Museum also possesses some of his water-colours.— His son David (1809-85) was also a painter of landscapes, which are only pale reflections of his father's works.

COX, Rev. Sir George William, Bart., M.A. English writer, born in 1827, died in 1902. He was educated at Rugby and Oxford, held curacies in Devonshire, and became vicar of Bekesborne, Kent, and rector of Scrayingham, York. In 1877 he became a baronet in succession to an uncle. Among his works are : *Tales of Ancient Greece*, a *History of Greece, Lives of Greek Statesmen, The Mythology of the Aryan Nations, Introduction to Comparative Mythology and Folk-lore, Latin and Teutonic Christianity, The Crusades*, and a *Life of Bishop Colenso.* He also edited *A Dictionary of Science, Literature, and Art.*

COXE, William. Historical writer, born in 1747, died in 1828 ; was educated at Eton and Cambridge, took orders, accompanied young men of wealthy families on continental tours, and published accounts of his travels. He was long rector of Bemerton, and held other preferments in the Church. His works include : *Travels into Poland, Russia, Sweden, and Denmark* ; *Travels in Switzerland* ; *Memoirs of Sir Robert Walpole* ; *Memoirs of Horatio Lord Walpole* ; *History of the House of Austria* ; *Memoirs of the Kings of Spain of the House of Bourbon* ; *and Memoirs of John, Duke of Marlborough.*

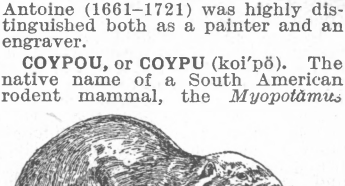
COXIE, or COXCIE, Michel van. Flemish painter, born in 1499, died in 1592. He travelled to Rome, where he remained several years attracted by the works of Raphael. Here he executed several paintings in fresco, and many other pieces. For Philip II. of Spain he executed an admirable copy of Van Eyck's altar-piece at Ghent. His works are now rare.

COXWELL, Henry. English aeronaut, born 1819, died 1900 ; early began to make balloon ascents, and devoted a great part of his life to ballooning. In 1862 he made a famous balloon ascent in company with Dr. J. Glaisher. He published a book in two vols., entitled *My Life and Balloon Experiences* (1887-89).

COYNE AND LIVERY. An ancient right or custom in Ireland which enabled the lord or chief to quarter his soldiers on his tenants. It was finally abolished in 1603.

COYPEL (kwà-pel), **Noel.** A French painter, born in 1628 or 1629, died in 1707 at Paris. He adorned the old Louvre and the Tuileries, and painted some fine pictures for the council hall of Versailles. His son Antoine (1661–1721) was highly distinguished both as a painter and an engraver.

COYPOU, or **COYPU** (koi'pŏ). The native name of a South American rodent mammal, the *Myopotâmus*



Coypou (*Myopotamus coypu*)

coypu, about the size of and considerably resembling a beaver. Its limbs are short, its tail in part bare and scaly, and it swims with great ease, its hind-feet being webbed. It

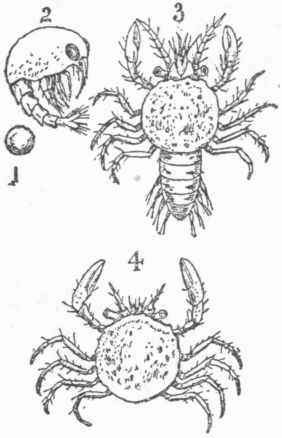
nhabits burrows by the banks of streams. It is valued for its fur (called *nutria* fur). Length when full grown, about 2 feet 6 inches.

COYSEVOX (kwâs-vō), **Antoine.** French sculptor, born in 1640, died 1720. Among his best works are: an equestrian statue of Louis XIV., the tomb of Cardinal Mazarin, the tomb of Colbert, the group of *Castor and Pollux*, *The Sitting Venus*, *The Nymph of the Shell*, *The Hamadryad*, *The Faun with the Flute*. His most famous work is *La Renommée*, at the entrance to the garden of the Tuileries, two winged horses bearing Mercury and Fame.

COZ'ENS, John Robert. English landscape painter in water-colours, born 1752, died 1799. He was the son of Alexander Cozens, an able artist in water-colours, whose father was the Czar, Peter the Great, and who was born in Russia of an English mother. Of the life of J. R. Cozens little is known, but he exhibited pictures in public as early as 1767, resided for some time on the Continent, especially in Italy, and was insane for several years before his death. He is described as "one of the most original and imaginative of landscape-painters, and the greatest of all the precursors of Turner and Girtin in the English school of water-colour."

COZUMEL'. An island in the Caribbean Sea, off the coast of Yucatan. The island was discovered in 1518, and here Cortes landed first in 1519.

CRAB. A popular name for all the ten-footed short-tailed crustaceans constituting the subord. Brachyura, ord. Decapoda, comprising many genera, distinguished from the lobster and other macrurous or long-tailed decapods by the shortness of their tail, which is folded under the body. The head and breast are united, forming the cephalothorax, and the whole is covered with a strong carapace. The mouth has several pairs of strong jaws, in addition to which the stomach has its internal surface studded with hard projections for the purpose of grinding the food. The stomach is popularly called the "sandbag"; a little behind it is the heart, which propels a colourless blood to the gills ("dead man's fingers"). The liver is the soft, rich yellow substance usually called the *fat* of the crab. They "moult" or throw off their calcareous covering periodically. The first pair of limbs is not used for locomotion, but is furnished with strong claws or pincers. Their eyes are compound, with hexagonal facets, and are pedunculated, elongated, and movable. Like most individuals of the class, they easily lose their claws, which are as readily renewed.



Spider Crab

1, Egg of crab. 2, First stage of growth. 3, Second stage of growth. 4, Perfect young Spider Crab. (All much enlarged.)

They generally live on decaying animal matter, though others live on vegetable substances, as the racer-crabs of the West Indies, which suck the juice of the sugar-cane. Most inhabit the sea, others fresh water, some the land, only going to the sea to spawn. Of the crabs several species are highly esteemed as an article of food, and the fishery constitutes an important trade on many coasts. The large edible crab (*Cancer pagūrus*) is common on the

Thornback Crab (*Maia squinado*)

British shores, and is much sought after. *See also* HERMIT-CRAB; LAND-CRAB; PEA-CRAB.

CRAB. A name given to various machines, especially to a kind of portable windlass or machine for

raising weights. Crabs are much used in building operations for raising stones or other weights, and in loading and discharging vessels.

CRAB-APPLE (*Pyrus Malus*). A small, wild, very sour variety of apple.

CRABBE (krab), **George.** An English poet, born at Aldeburgh, Suffolk, 1754, died at Trowbridge, Wilts, 1832. Having been educated for the medical profession, he settled as a surgeon and apothecary in his native village, but soon finding his practice insufficient to afford him a livelihood, he resolved to try his fortune as *littérateur* in London. He obtained the friendship and assistance of Burke, published his poem *The Library*, and soon after entered the Church. He was appointed domestic chaplain to the Duke of Rutland, and afterwards obtained ample preferment.

In 1783 appeared *The Village*, which was followed two years afterwards by *The Newspaper*. *The Parish Register* appeared in 1807. *The Borough* appeared in 1810, and was followed in 1812 by *Tales in Verse*, and in 1819 by *Tales of the Hall*. The latter years of Crabbe's life were spent in the peaceful discharge of his professional duties at Trowbridge, in Wiltshire, a living which he had received in 1814. His poems are all characterized by homely truthfulness, simplicity, and pathos, and have been greatly praised by Sir Leslie Stephen in his *Hours in a Library*. — BIBLIOGRAPHY: Canon Ainger, *Crabbe* (in English Men of Letters Series); René Huchon, *George Crabbe and his Times*; A. M. Broadley and W. Jerrold, *The Romance of an Elderly Poet*.

CRACKLIN. A species of chinaware which is ornamented by a network of small cracks in all directions. The ware receives the small cracks in the kiln, with the effect that the glaze or enamel which is afterwards applied appears to be cracked all over.

CRACOW'. A fortified town in Poland, the old capital of the country, from 1815 to 1846 capital of a republic of the same name, and forming part of Austrian Galicia until 1919. It is situated on the left bank of the Vistula, where it becomes navigable, and consists of Cracow proper, or the old city, and several suburbs. It is the see of a bishop and is well built. The cathedral, a fine old Gothic edifice, contains monuments of many Polish kings and of Kosciusko. The university was founded by King Casimir in 1364, but gradually fell into decay, and was reorganized in 1817; but a new era opened for it, however, in 1861, when Francis Joseph I. permitted Polish to be again used as the language of instruction. It has a library of over 300,000 volumes. On a hill near the town stands the monument of Kosciusko, 120 feet high. Pop. 221,260.

CRAD'OCK. A town of Cape Province, 150 miles north by east of Port Elizabeth, with which and with other important places it is connected by railway; a market town and agricultural centre. It has a town hall, a public library, and a Dutch church that cost £30,000. The climate is exceedingly healthy, and 3 miles north are warm sulphur springs, used in the cure of gout and rheumatism. Pop. 6800, of which 3609 are Europeans.

CRAG. In geology, a local name in England for shelly deposits in Norfolk and Suffolk, usually of gravel and sand, of the Pliocene period, subdivided into three members, viz. the Upper or *Mammaliferous Crag*, the *Red Crag*, and the Lower or *Coralline Crag*.

CRAG AND TAIL, or **CRAIG AND TAIL.** In geology, a name applied to a hill formation common in Britain, in which a bold and even precipitous front is presented on one side, while the opposite side is formed of a sloping declivity. The rock on which Edinburgh Castle stands, with its "tail" gradually sloping down to Holyrood, presents a fine example. The crag represents a rocky boss that resisted the passage of glacial ice and suffered in most cases from plucking action, while the tail is produced by the deposit of ice-borne drift material in the shelter afforded on the farther side.

CRAIG, Edward Gordon. English actor. A son of Ellen Terry, he was born 16th Jan., 1872, and educated at Bradfield College and in Germany. He acted under Henry Irving and then became a producer and made his reputation by improving the stage and its scenery. In 1913 he made his home in Florence where he founded a school for studying the art of the theatre, and issued a paper, *The Mask*. His ideas are set out in *The Art of the Theatre*, 1905 and 1911; *Towards a New Theatre*, 1913; *The Theatre Advancing*, 1921; *Scene*, 1923; and *A Production*, 1930. His *Life of Irving* appeared in 1930, and his tribute to *Ellen Terry—the Actress and the Mother* in 1932.

CRAIG, John. Scottish reformer, born 1512, died 1600. He became Knox's colleague in Edinburgh, refused to publish the banns between Mary and Bothwell, assisted in drawing up the *Second Book of Discipline*, and compiled the National Covenant signed by the king in 1580.

CRAIG, Sir Thomas. A Scottish writer on jurisprudence, was born in the year 1538, died 1608. He is remembered by his *Treatise on Feudal Law*.

CRAIGAVON, James Craig. First Viscount, was born in 1871 and educated at Merchiston. He entered Parliament in 1906, and held various posts in the Coalition Government between 1917 and 1921. On 7th June, 1921, he became the first Prime Minister of Northern Ireland. He was raised to the peerage in 1927.

CRAIGIE (krā'gi), **Mrs. Pearl Mary Teresa** (maiden name Richards). Novelist and miscellaneous writer under the pen-name of *John Oliver Hobbes*, was born at Boston, United States, 1867; married, but divorced her husband; died in 1906. She published a series of novels and plays, and contributed to periodicals. Her works include: *Some Emotions and a Moral* (1891); *The Sinner's Comedy*; *The Gods, Some Mortals, and Lord Wickenham*; and *Tales about Temperaments*.

CRAIGMYLE, Baron. Scottish lawyer and politician. Thomas Shaw was born at Dunfermline 23rd May, 1850, and after a distinguished career at the University of Edinburgh became an advocate. In 1892 he entered the House of Commons as Liberal M.P. for the Hawick district, and in 1894-95 he was Solicitor-General for Scotland. In 1905 he was made Lord Advocate, but in 1909 he left politics to become a Lord of Appeal and a life peer as Lord Shaw of Dunfermline. He retired in 1929 when he was made an ordinary peer as Baron Craigmyle, the name of his Aberdeenshire home. His writings include *Letters to Isabel* and *Darnley: A Historie*.

His son, Alexander Shaw (born 1883), was in Parliament as a Liberal from 1915 to 1923. He then became prominent in the shipping world, becoming a director of the P. and O., and in 1927 President of the Chamber of Shipping. He is also a director of the Bank of England.

CRAIK, Dinah Maria. English novelist, born at Stoke-upon-Trent, 1826, her father's name being Mulock. In 1865 she became the wife of George Lillie Craik (a nephew of the subject of next article). She published a volume of poems under the title of *Thirty Years*, many essays and papers on ethical and domestic subjects; books for young people, and about twenty-four novels, the best of which are: *John Halifax, Gentleman*; *A Life for a Life*; *Agatha's Husband*; and *The Woman's Kingdom*. She died in 1887.

CRAIK, George Lillie. A miscellaneous writer, who was born in Fifeshire in 1798, and died at Belfast 25th June, 1866. He was an extensive contributor to the *Penny Cyclopædia* in the departments of history and biography. His first independent work of any importance was his *Pursuit of Knowledge under Difficulties* (1830-31). Other works were: *Romance of the Peerage*; *Spenser and his Poetry*; *History of Literature and Learning in England*, afterwards recast into *History of English Literature and the English Language*; *History of British Commerce*; *English of Shakspeare*; and *Bacon: his Writings and Philosophy*. In 1849 he was appointed professor of English literature in Queen's College, Belfast, an appointment which he held till his death.

CRAIL. A royal burgh and seaport of Scotland, in Fifeshire. It is a very ancient burgh, and has remains of a priory college and ruins of a castle once a royal residence. Pop. (1931), 1058.

CRAMBE. A genus of cruciferous plants, natives of Europe and Asia. They are perennial herbs, with stout branched stems and broad leaves. One species, *C. maritima*, known as sea-kale, is a native of the sandy and shingly coasts of Britain.

CRAM'LINGTON. An urban district of England, Northumberland, about 4½ miles S.W. of Blyth, with numerous large collieries. Pop. (1931), 8238.

CRAMP. A variety of spasm, or sudden, involuntary, and painful contraction of a muscle or muscles. It is usually caused by a sudden change of temperature, as in bathing, exposure to cold, over-exertion of the muscles, or the bringing into action muscles unaccustomed to exercise.

CRANACH, or **KRANACH** (krä'näh), **Lucas.** A German painter, born in 1472, died in 1553. He was patronized by Frederick of Saxony, and accompanied him in his pilgrimage to Jerusalem. On the commencement of the Reformation movement he became the intimate friend of Luther and Melanchthon, whose portraits, as taken by him, are among the most interesting memorials

of the age. His works, chiefly portraits and historical subjects, are numerous and much prized. His son Lucas (died 1586) also gained great distinction as a painter.

CRAN'BERRY. The fruit of *Oxycoccus palustris*, nat. ord. Vacciniaceæ (whortleberries), a native of Europe, North Asia, and North America. It is also called *Moss-berry* or *Moorberry*, as it grows only on peat-bogs or swampy land, usually among masses of sphagnum. The berry, when ripe, is globose and dark-red, and a little more than ¼ inch in diameter. These berries form a sauce of exquisite flavour, and are used for tarts. The American cranberry, a native of Canada and the United States, is the *O. macrocarpus*. It has larger berries than the European species, and is extensively cultivated in some localities. *Vaccinium Vitis idœa*, the cow-berry, is often called the cranberry in Scotland.

CRANBORNE. A small but ancient town of England, Dorsetshire, 10 miles N.E. of Wimborne, with one of the oldest and largest churches in the county. It gives the title of viscount to the Marquess of Salisbury. Pop. 700.—**Cranborne Chase** was an extensive forest track, now enclosed, partly in Dorset, partly in Wilts.

CRAN'BROOK. A small town of England, County Kent, 47½ miles S.E. of London, where the first woollen manufactory in England was established by the Flemings in the reign of Edward III. Pop. (1931), 3829.

CRANE. The common name of members of the Gruidæ, a widely distributed family of wading birds. They are generally of considerable size, and remarkable for their long necks and stilt-like legs, which eminently fit them for living in marshes and situations subject to inundations, where they usually seek their food. This is partly of vegetable matter, but they also devour insects, worms, frogs, lizards, reptiles, small fish, and the spawn of various aquatic animals. They build their nests among bushes or upon tussocks in marshes, and lay but two eggs. Cranes annually migrate to distant regions, and perform voyages astonishing for their great length.

The common crane (*Grus cinerĕa*) has the general plumage ash-grey, the throat black, the rump ornamental with long, stiff, and curled feathers, the head with bristly feathers; legs black; length about 4 feet. It inhabits Europe, Asia, and the north of Africa. The crowned crane (*G. pavonīna*, or *Balearica pavonīna*) has the general plumage bluish ash-grey, the tail and primary quills black, the wing-coverts pure white; the head is crowned with a tuft of slender yellow feathers, which can be spread out at pleasure. It inhabits North and West Africa. The demoiselle crane (*Anthropoides virgo*) is so called from the elegance of its form. It is ash-grey, and the head is adorned with two tufts of feathers formed by a prolongation of the ear-coverts. Its habitat is Africa and the south of Europe.

Crowned Crane (*Balearica pavonina*)

Among North American species are the whooping crane (*Limnogeranus americana*), a larger species than the common crane, and the brown or sand-hill crane (*Grus canadensis*).

CRANE. A machine for raising weights and depositing them at some distance from their original place, for example, raising bales from the hold of a ship and depositing them on the quay. A very efficient crane much used on quays consists of a jib or transverse beam, inclined to the vertical at an angle of from 40° to 50°, which, by means of a collar, turns on a vertical shaft. The upper end of the jib, which is stayed to the top of the shaft, carries a fixed pulley, and the lower end a cylinder, which is put in motion by a wheel and pinion. The weight is made fast to a rope or chain which passes over the pulley and is wound round the cylinder. On turning the cylinder (either by a

winch handle attached to the wheel which works in the pinion, or by the application of steam-power) the weight is raised as far as necessary. The jib is then turned on its arbor till the weight is brought immediately over the spot where it is to be deposited, and the moving power is withdrawn so as to allow the weight to descend by its own gravity.

In a *derrick* crane the jib is not stayed to the shaft, the stay being replaced by a chain which is used to raise or lower the jib so as to alter its reach.

The *travelling* jib crane contains the same elements as the fixed crane, but has its foundation mounted on a wheeled truck. Stability is provided for by weighting the tail end of the revolving part; in steam-cranes the boiler serves as the counterweight.

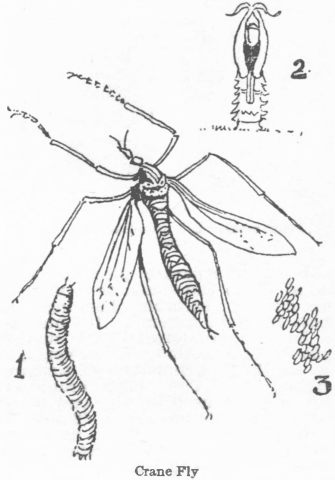
The *hammer-headed* crane, which is extensively used in shipbuilding yards, consists of a steel-braced tower, on the top of which the horizontal jib revolves. The jib is in the form of a double cantilever, the longer arm of which carries the lifting crab, which can be moved along the jib without altering the level of the load.

In *overhead travelling* cranes the chief parts are a pair of horizontal girders, called the bridge, which carry rails on which the crab runs; two end carriages on which the bridge rests; and running wheels for the end carriages, which allow the bridge to be moved in a direction perpendicular to its own length.

Hydraulic power was at one time largely used for heavy and continuous crane work, but it has now been almost entirely superseded by the electric motor, which is admirably adapted for use with cranes.

CRANE, Walter. Artist and prominent Socialist, born 1845, died 1915. Apprenticed to W. J. Linton, the well-known wood-engraver, he soon began to illustrate books, and in 1862 exhibited a picture—*The Lady of Shalott*—at the Royal Academy. He held various posts in connection with art education, such as that of principal of the Royal College of Art, South Kensington (1898-99), and had numerous medals and other honours conferred upon him in recognition of his artistic work. He belonged essentially to the imaginative and poetic school of artists, and his tendency was towards pre-Raphaelitism and mediævalism, the decorative element also making itself more or less prominent. Among his chief pictures are: *Renascence of Venus, Fate of Persephone, Europa, The Bridge of Life, La Belle Dame Sans Merci, England's Emblem, The Rainbow and the Wave, Britannia's Vision, The World's Conquerors. The Sirens Three* is a poem written and decoratively illustrated by himself. Spenser's *Faerie Queene* and *Shepherd's Calendar*, and some of Shakespeare's plays, were illustrated by him; and he did much in the decoration of buildings internally. He aided the Socialist movement, both as a writer and as a lecturer. Among his writings are: *An Artist's Reminiscences* (1907), and *William Morris and Whistler* (1911).—Cf. P. G. Konody, *The Art of Walter Crane*.

CRANE-FLY. A genus of two-winged (dipterous) insects (Tipŭla), remarkable for the length of their



Crane Fly

1, Larva. 2, Pupa case. 3, Eggs

legs. *Tipŭla oleracĕa* is the well-known Daddy-long-legs, whose larva is very destructive to the roots of grain crops.

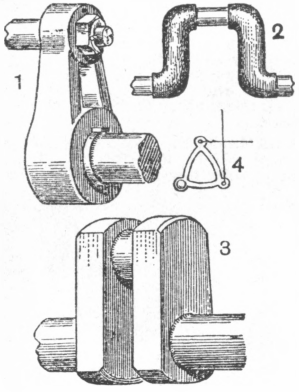
CRANE'S - BILL. The popular name given to the species of Geranium, from the long slender beak of their fruit. Eleven species are found in Britain. *See* GERANIUM.

CRAN'GANORE, or **KODUNGALUR.** A town in India, Presidency of Madras, state of Cochin, on the Malabar coast. Pop. 33,200. It is the traditional field of St. Thomas's labours in India. Jews have been settled here since the fourth century;

and it is certain the Syrian Church was established before the ninth.

CRANIOL'OGY. The science which investigates the significance of the structure, form, proportions, and dimensions of the skull as indications of race.

CRANK. A "handle" on a machine shaft for turning it. It



Cranks

1, Single crank. 2, 3, Double cranks. 4, Bell crank

may be a separate piece of steel keyed on to the shaft, or it may be formed by suitably bending the shaft itself in a forge. Its purpose is to change longitudinal motion into circular motion, or vice versa, as the *crank* of a grindstone, of a steam-engine, etc. The single crank (1) can only be used on the end of an axle. The double crank (2 and 3) is employed when it is necessary that the axle should be extended on both sides of the crank. The bell-crank (4), so called from its being much used in bell-hanging, is for a totally different purpose to the others, being used merely to change the direction of motion, as from a horizontal to a vertical line.

CRAN'MER, Thomas. Archbishop of Canterbury, and famous for the part he played in the English Reformation during the reign of Henry VIII., was born at Aslacton Notts, in 1489; executed by burning at Oxford, 1556. He entered Jesus College, Cambridge, in 1503, took the degree of M.A., obtained a fellowship, and in 1523 was chosen reader of theological lectures in his college, and examiner of candidates for degrees in divinity. An opinion which he gave on the question of Henry VIII.'s proposed divorce from Catherine brought him under the favourable notice of the king. Cranmer was sent for to court, made a king's chaplain, and commanded to write a treatise on the subject of the divorce. In 1530 he was sent abroad with others to collect the opinions of the divines and canonists of France, Italy, and Germany, on the validity of the king's marriage. At Rome he presented his treatise to the Pope, but his mission was fruitless.

In Jan., 1533, he was appointed Archbishop of Canterbury. Soon after he set the Papal authority at defiance by pronouncing sentence of divorce between Henry and Catherine, and confirming the king's marriage with Anne Boleyn. The Pope threatened excommunication, and an Act of Parliament was immediately passed for abolishing the Pope's supremacy, and declaring the king chief head of the Church of England. The archbishop zealously promoted the cause of the Reformation; and through his means the Bible was translated and read in churches, and monastic institutions were vigorously suppressed. In 1536 he pandered to Henry's passions by promoting the divorce of Anne Boleyn. This and other services secured him in the king's favour, who appointed him by will one of the Council of Regency to Edward VI.

Thomas Cranmer

In 1547 appeared the *Homilies* prepared under his direction, and in 1550 he published *Defence of the True and Catholic Doctrine of the Sacrament*. By his instrumentality the liturgy was drawn up and

established by Act of Parliament, and articles of religion were compiled, the validity of which was enforced by royal authority, and for which infallibility was claimed. The exclusion of the Princess Mary from the crown, by the will of her brother, was a measure in which Cranmer joined the partisans of Lady Jane Grey, apparently in opposition to his own judgment.

With others who had been most active in Lady Jane's favour he was sent to the Tower on the accession of Mary. He was tried on charges of blasphemy, perjury, incontinence, and heresy, and was sentenced to be degraded and deprived of office. After this flattering promises were made, which induced him to sign a recantation of his alleged errors, and return, in fact, to the Roman Church. But when he was brought into St. Mary's Church, Oxford, to read his recantation in public, instead of confessing the justness of his sentence, and submitting to it in silence or imploring mercy, he calmly acknowledged that the fear of death had made him belie his conscience; and declared that nothing could afford him consolation but the prospect of extenuating his guilt by encountering, as a Protestant penitent, with firmness and resignation, the fiery torments which awaited him. He was immediately hurried to the stake, where he behaved with the resolution of a martyr.—BIBLIOGRAPHY: Dean Hook, *Lives of the Archbishops of Canterbury*; A. F. Pollard, *T. Cranmer and the English Reformation*, 1489-1556.

CRAN'NOGS. The name given in Ireland and Scotland to the platforms supported by piles in lakes, which were in use as dwelling-places and places of refuge among the old Celts. *See* LAKE DWELLINGS.

CRAN'TARA (Gael. *crean-tarigh*, a cross of shame, implying infamy for disobedience). The cross which formed the rallying symbol in the Highlands of Scotland on any sudden emergency. *See* FIERY CROSS.

CRAPE. A light transparent stuff, like gauze, made of raw silk, gummed and twisted on the mill, woven without crossing, and much used in mourning. There are two varieties —soft or Oriental crape, and hard or crisped crape. Hard crapes are made at Norwich, Yarmouth, Manchester, and Glasgow.

CRA'SHAW, Richard. An English poet, born in London 1613, died 1649; educated at the Charterhouse and at Cambridge. In 1637 he became a fellow of Peterhouse, and having been admitted to orders was noted as an eloquent and powerful preacher. In 1644 he was ejected from his fellowship by the Parliamentarians, and proceeded to Paris, where he became a convert to the Roman Catholic faith, and was appointed to a canonry at Loretto. *Epigrammata Sacra* appeared in 1634; *Steps to the Temple* and *The Delights of the Muses* were published in London in 1646; and a posthumous volume appeared at Paris in 1652, under the title *Carmen Deo Nostro*. Crashaw displays considerable poetic genius in the treatment of religious subjects, and his works are said to have furnished hints to both Milton and Pope. A complete edition of his works by A. R. Waller appeared in 1904.

CRASSULA'CEÆ. The house-leek family, a nat. ord. of polypetalous dicotyledons. It consists of succulent plants, with herbaceous or shrubby stems, and annual or perennial roots, growing in hot, dry exposed places in the more temperate parts of the world, but chiefly South Africa. Many species of Crassula, Sempervivum, Sedum, etc., are cultivated in greenhouses for the beauty of their flowers. The flora of Britain contains about a dozen species.

CRASSUS, Marcus Licinius. The Roman triumvir, surnamed *Dives* (the rich), on account of his vast riches, was born about 115 B.C., died 53 B.C. He took part with Sulla in the civil war; and as prætor, in 71 B.C., he defeated Spartacus and the revolted slaves at Rhegium. In 70 B.C. he was elected consul, having Pompey as his colleague; and in 60 B.C. Cæsar, Pompey, and Crassus formed the first triumvirate. Five years later he again became consul, and obtaining Syria for his province he made war on the Parthians, but was defeated and slain at Carrhæ. It is said that Surenas, the Parthian general, caused molten gold to be poured into his mouth, in scorn of his notorious love of wealth, and so put him to death. It is also said that when Crassus' head was sent to the Parthian king, Orodes, he was at a performance of the *Bacchæ* of Euripides, and the actor who took the part of Agave substituted the real head for the property head of Pentheus.

CRATER. The cup-like orifice or mouth of a volcano. Craters may be central or lateral, and there may be several subsidiary ones, which may shift their places, or become merged into others.

CRATI'NUS. An Athenian comic poet to whom the invention of political comedy is attributed; died

422 B.C. at the age of ninety-seven. Some fragments of his works remain, His last play, the *Putine* (Bottle) won the first prize for comedy when the *Clouds* of Aristophanes was third.

CRAVAT'. A neckcloth; an article of silk, muslin, or other material worn by men about the neck; so called from Fr. *Cravate*, a Croat, because this piece of dress was adopted in the seventeenth century from the Croates who entered the French service. Towards the end of the eighteenth and the beginning of the nineteenth century the cravat attained an incredible degree of extravagance, but common sense at last brought in the simpler style.

CRAVEN. District of Yorkshire. In the West Riding, it is a moorland area around Skipton, where there is a Craven Museum. The Craven Hunt is in Berkshire.

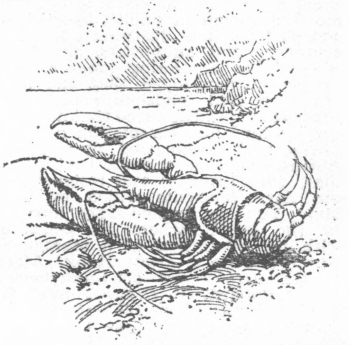
The title of Earl of Craven has been borne since 1633, except during the years 1697 to 1801, by the family of Craven. Sir William Craven won some reputation by the services he rendered to Elizabeth, Queen of Bohemia, the daughter of James I. In 1633 he was made an earl, but the title became extinct on his death, 9th April, 1697. The barony, however, created in 1627, passed to a relation. In 1801 William, the 7th baron, was made an earl. The earl's seat is Coombe Abbey, Warwickshire, and his eldest son is called Viscount Uffington.

Elizabeth, wife of the 6th Baron Craven, was a lady of note. Born in 1750, a daughter of the Earl of Berkeley, she married Lord Craven in 1767, and after his death a German margrave. She wrote some plays and acted in one or two of them. She died at Naples, 13th Jan., 1828, leaving some *Memoirs*.

CRAWFORD, Francis Marion. Novelist, born in Italy, 1854, son of the American sculptor Thomas Crawford; educated in America, at Cambridge (England), and on the European continent; long a resident in Italy. His works include: *Mr. Isaacs*, *Dr. Claudius*, *A Roman Singer*, *Marzio's Crucifix*, *Saracinesca*, *Sant' Ilario*, *A Cigarette-maker's Romance*, *The Witch of Prague*, *The Three Fates*, *Pietro Ghisleri*, *Love in Idleness*, *Casa Braccio*, *Taquisara*, *Soprano*, and *A Lady of Rome*. His original play *Francesca da Rimini* was produced in Paris by Sara Bernhardt in 1902. He died in 1909.

CRAYER, Gaspar. A Dutch painter, born at Antwerp in 1582, died at Ghent 1669. He gained a great reputation as an historical and portrait painter. He painted a great number of altar-pieces for Ghent, Brussels, and other cities of the Netherlands, and received high praise from Rubens.

CRAYFISH. A name of various crustaceous animals, the common crayfish being *Astăcus fluviatĭlis*, the river lobster, a macrurous (long-tailed), ten-footed crustacean, resembling the lobster in appearance and habits. It inhabits the fresh waters of Europe and the north of Asia, and is common in some of the streams of England and Ireland, but not of Scotland. It lurks under stones or in holes in the banks. Its food consists of small molluscs or fishes, the larvæ of insects, and almost any sort of animal matter. In the United States crayfish of the genera *Astacus* and *Cambărus* are common, and sometimes by their



Crayfish

burrowing habits injure mill dams and river dykes, such as the levees of the Mississippi. Crayfish are regarded by many as furnishing a delicate dish for the table. The term crayfish or *crawfish*, especially the latter form, is also applied to the spiny lobster, *Palinūrus vulgāris*, a large marine crustacean wanting the large claws of the lobster; often eaten in the south and west of England.

CRAY'ONS. Coloured pencils obtained from certain mineral substances in their natural state, but more commonly manufactured from a fine paste of chalk or pipe-clay coloured with various pigments, and consolidated by means of gum or wax. A kind of *crayon painting* (or *pastel* painting) is practised to some extent, the colouring-matter in a soft state being rubbed on with the finger. Its chief advantages consist in the

great facility of its execution, and the soft beauty and richness of colouring of effects so easily produced. The paper used has a specially granulated surface.

CREAM OF TARTAR, or **POTASSIUM BITARTRATE** ($KHC_4H_4O_6$). Exists in grapes, tamarinds, and other fruits. It is prepared from the crystalline crust (crude tartar or argol) deposited on the vessels in which grape juice has been fermented. The argol is dissolved by boiling with water, the mixture filtered, and the cream of tartar allowed to crystallize out. The commercial product usually contains a small percentage of calcium tartrate. It is frequently employed in medicine for its diuretic, cathartic, and refrigerant properties; as a mordant in dyeing wool; and as an ingredient in baking-powder.

CREAM SEPARATOR. Up to about 1877 the only method of separating the cream from the milk was by allowing the milk to stand in shallow pans until the cream rose and formed a layer on the surface by the action of gravity, being lighter than the milk. This method, of course, is still in use, and the rise of the cream is accelerated by packing the pans in ice, by running cold water round them, or by submerging cans of the milk for some hours in cold water. These methods, however, are slow and inconvenient compared with the method of employing centrifugal force, now in use in all large establishments.

There are various forms of separator in use, but the principle is the same in all. A steady stream of milk is allowed to run into a drum or cylinder, which is the essential part of the machine, and which is made to revolve at the rate of several thousand revolutions per minute. The force thus exerted upon the liquid drives the heavier milk to the outside and leaves the lighter cream in a layer next the revolving axis, which may be vertical or horizontal. The exit for the cream is placed near the axis, that for the skim milk necessarily nearer the periphery. Separators are made in sizes suitable for all dairies, and are driven by hand, horse, steam-power, etc. These have various advantages over the old method: the greatest quantity of cream is obtained, and in a fresh condition; no casein is left in the cream; and dairy working is greatly facilitated.

CRE'ASOTE. *See* CREOSOTE.

CREASY (krē'si), **Sir Edward Shepherd.** English historian, born in 1812, died in 1878. He was educated at Eton, and at King's College, Cambridge, of which he was elected a fellow in 1834. He was called to the Bar at Lincoln's Inn in 1837, and was for about twenty years a member of the home circuit. In 1840 he was appointed professor of history at the London University, and in 1860 was made Chief Justice of Ceylon, receiving also a knighthood. His principal works are: *The Rise and Progress of the British Constitution*, and *The Fifteen Decisive Battles of the World.*

CREA'TIONISM, or **CREATIANISM.** The doctrine that a soul is specially created for each human fœtus as soon as it is formed in the womb: opposed to *Traducianism*, which teaches that the souls of children as well as their bodies are begotten by the parents; and to *Infusionism*, which holds that souls are pre-existent and that a soul is divinely infused into each human fœtus as soon as it is formed by generation. The term *Creationism* has also been applied: (1) to the doctrine that the material of the universe was created by God out of nothing already existing—it is thus opposed to Pantheism; (2) to that theory of the origin of the universe which is opposed to Evolution, namely, that the various species of living beings were immediately and directly created by God, and are not therefore the outcome of an evolutionary process.

CRÉBILLON (krā-bē-yōn), **Prosper Jolyot de.** A French writer of tragedy, was born at Dijon 1674, died 1762. His first play, *La Mort des Enfants de Brutus*, was rejected by the actors; but his next productions, *Idoménée* (1705) and *Atrée* (1707), were successful. These were followed by *Rhadamiste* (1711), *Xerxes* (1714), and *Semiramis* (1717). At the age of seventy-six he wrote *The Triumvirate, or The Death of Cicero*, which was brought upon the stage in his eighty-first year.—His son, Claude Prosper, born 1707, died 1797, was in high repute for his wit and his writings. His chief works are: *Le Sopha*, *Le Hasard du Coin du Feu*, and *Les Égarements du Cœur et de l'Esprit*, all highly improper.

CRÈCHE (krāsh). A public nursery for the children of poor women who have to work out during the day, where for a small payment they are nursed and fed during the day, remaining with their parents at night. These institutions were first started in Paris in 1844; they were soon afterwards introduced into Great Britain, and are now common in large towns. The National Society of Day Nurseries was founded in 1901.

CRÉCY, or CRESSY. A small town of France, in the department of Somme, 9 miles N. of Abbeville and 100 N of Paris; pop. 1500. It is celebrated on account of a battle fought here, 26th Aug., 1346, between the English and French. Edward III. and his son, the Black Prince, were both engaged, and the French were defeated with great slaughter, 30,000 foot and 1200 horse being left dead on the field; among whom were the King of Bohemia, the Count of Alençon, Louis, Count of Flanders, with many others of the French nobility.

CRE'DENCE. A small table by the side of the altar or communion-table, on which the bread and wine are placed before they are consecrated. Old credence-tables still exist in some churches in England, and there is one of the fifteenth century at the church of St. Cross, near Winchester.

CRED'IT. In economics, is the postponement agreed on by the parties of the payment of a debt to a future day. It implies confidence of the creditor in the debtor; and a "credit system" is one of general confidence of people in each other's honesty, solvency, and resources. By means of a credit system a comparatively small stock of actual cash can be made to do duty for carrying on a number of different transactions; but it is indispensable for every good system of credit that cash should be instantly available when required, and this principle applies to every species of transaction where postponed payment is concerned. It is not always the case, as some economists of the German historical school hold, that in modern life there is a direct substitution of credit for money. The tendency is often towards a substitution of cash for credit, at least in old fields of industry, the use of credit prevailing mainly in relatively new fields.

Public credit is the confidence which men entertain in the ability and disposition of a nation to make good its engagements with its creditors; on the state of public credit depend the ease and expense of raising public loans. The term is also applied to the general credit of individuals in a nation; when merchants and others are wealthy and punctual in fulfilling engagements; or when they transact business with honour and fidelity; or when transfers of property are made with ease. So we speak of the credit of a bank when general confidence is placed in its ability to redeem its notes, and the credit of a mercantile house rests on its supposed ability and probity, which induce men to trust to its engagements.

Credit must be distinguished from capital (q.v.); for though a man's credit is for him capital, credit is only a means of transferring the agents of production (land, labour, capital) from one individual to another, and is therefore not truly national capital. But by facilitating this transfer, it enables these agents to go where they can be most advantageously used, and facilitates the specialization and large-scale production which are at the root of industrial efficiency.—BIBLIOGRAPHY, H. D. Macleod, *Theory of Credit*: Taylor, *The Credit System*; A. J. Wolfe, *Foreign Credits: a Study of the Foreign Credit Problem*; J. A. Todd, *The Mechanism of Exchange*: R. Benson, *State Credit and Banking during the War and After*.

CREDIT ASSOCIATIONS. The ways in which credit generally may be secured are very many, but this article will discuss only what may be described as ordinary companies for the transaction of financial business, such as the ordinary bank or the various investment societies working on commercial principles.

Every bank, however, is a credit institution, and the credit associations are not only similar to a bank and discharge some of its functions, but some of them are even known by the name of "bank." Credit associations work in humbler spheres, and at first, at all events, on a smaller financial scale. Their function is to bring credit and financial aid to the poorer classes. Their existence is a tribute to the far-seeing analysis of the political economist, whose doctrine of capital as the mother of industry they tend to confirm strongly.

The increasing part taken by the public authority in financing individuals and movements is an activity similar to that of credit associations, but to be distinguished from them. Recently in the United Kingdom the housing question has afforded an example of this. Up to 20th Aug., 1920, local authorities had issued certificates for 17,593 houses, involving a grant of £4,256,293, and 1000 houses were in hand. Again, under the power of the Land Settlements (Facilities) Act, 1919, the Public Works Loan Commissioners are now issuing loans from the total of £20,000,000 provided for the settlement of ex-service men under that Act. Then again, under the Small Holdings Allotment Act of

1908, the same Commissioners were to lend to county councils, 55 in number in England and Wales (not to mention Scottish loans), and including 1489 separate loans, sums aggregating to £5,021,635 for the same purpose. In the parliamentary estimate for 1920-1, £916,500 were allowed for the agricultural training of ex-service officers and men.

The bodies reported upon by the Registrar of Friendly Societies consist of friendly societies, industrial and provident societies, building societies, trade unions, workmen's compensation schemes, loan societies, scientific societies, post office, trustee, and railway savings banks. Some of these are credit institutions while others are not, and there is a difference between building societies and savings banks, the latter being formed to encourage thrift, whereas the former are to supply credit or capital. Of the 273 bodies reported upon in the year 1918, the Registrar tells us that they had 451,181 members, and funds amounting to £1,172,592, but that their solvency averaged 17*s.* 2*d.* in the pound in England, 14*s.* 4*d.* in Wales, and 18*s.* 11*d.* in Scotland. This result shows that while savings banks and building societies have done useful work, their financial success is not unqualified.

Yet the need of credit facilities has been felt keenly by the "small man" in our community, as is shown by the friendly societies, by the growth and success of co-operative societies, and by the formation of garden cities. All these movements are decidedly important at the present time, for projects of reconstruction after war require capital and facilities for credit. Here the "small man" is still at a disadvantage. Such movements as the Schulze-Delitzsch and the Raiffeisen "loan banks" in Central Europe, and the Italian *Banche Popolari* should be studied. They have been the means of bringing credit to the aid, and not the detriment, of people working on a humbler scale. Some of our own banks, however, in spite of the great amalgamations, have shown much foresight by affording "accommodation" to humble people and opening agencies in villages.

Co-operation for credit was organized in Germany about 1845. From the purchase of material to co-operative supply was but a step, however, and then another step to a co-operative supply of money; and Schulze saw his first credit association in 1850. At first it was not co-operative, and Schulze said that the problem was how to obtain capital without a "capital guarantee." In spite of prosecutions the Schulze-Delitzsch institutions have done very well in Belgium, Italy, and France with unlimited liability. F. W. Raiffeisen was a civil servant in Alsace, and was moved to act by the troubles of the poor in matters of credit. After the upheaval of 1848, Raiffeisen began in a small way a loan bank in 1849. It was only in 1854 that he opened the second bank, but since then these banks have spread by hundreds and even thousands, and "Father Raiffeisen," though dead, is known all over Central Europe. It is their boast that after fifty years' service neither member nor creditor has lost a penny. Character is the qualification for membership; after approval a bank or a union of banks is managed by a committee of members in which no difference is made between poor and rich. No salaries are paid.—Banking in the ordinary sense is strictly forbidden; they are *loan* associations, and their sole instrument credit. All that is asked for is a note of hand of the borrower, unbacked, or backed by one or two, according to the case. The success has been great, and provoked not a little jealousy. The Rhineland courts have long allowed trust monies to be deposited in these loan banks, which are now found in town and country throughout Central Europe.

Italy has been a home of banking and of usury for centuries. Luzzati, at first a disciple of Schulze-Delitzsch, began his work by founding the Banche Popolari in 1863. He did away with unlimited liability; he reduced shares and the time allowed for payment. The result was satisfactory. Although the banks are mainly for borrowing from, they have savings departments also. Luzzati obtained public confidence and credit with large banks by capitalizing "honesty," and specially the honour of his banks. The Banche Popolari are a success and a boon. Their balance sheets and business order prove most acceptable. By the co-operative principle, which avoids so much risk, banks of this kind have acquired a reputation as the safest depositories for money in Italy. There are other institutions of the kind in Italy, such as the *Casse Rurali*, the name of which suggests their sphere. Administration, co-operatively and economically, the "capitalization of honesty," and such general principles are at the back of the success. No doubt the proper study of mankind is man, and the success of loan banks and such credit

associations is dependent upon that study. The men behind the bank are all-important. In the United Kingdom we seem to be on the eve of an expansion of this method of helping the "small man" to financial prosperity, occupation, and production.

CRÉDIT FONCIER (krā-dē fon-syā). A peculiar mode of raising money on land in France, the peculiarity of which is that the advance must not exceed one-half of the value of the property pledged or hypothecated, and that the repayment of the loan is by an annuity terminable at a certain date. Several companies have been established by the French Government with the privilege of making such loans.

CRÉDIT MOBILIER (krā-dē mō-bēl-yā). A scheme which originated in France in 1852, its objects being to undertake trading enterprises of all kinds on the principle of limited liability, to buy up existing trading companies, and to carry on the business of bankers and stock-jobbers.

CRED'ITON. A town of England, in Devonshire, on the Creedy, a tributary of the Exe, 8 miles N.W. of Exeter. It is the birth-place of the Anglo-Saxon Winifred or St. Boniface, and was the seat of a bishop from 909 to 1050. Pop. (1931), 3490. Until 1918 it gave its name to the Crediton or Northern (parliamentary) Division of Devonshire.

CREECH, Thomas. English translator, born in 1659, died by his own hand at Oxford 1700. He received his education at Sherborne Free School, and at Oxford, where he took the degree of M.A. in 1683. He translated into English verse Lucretius, Horace, and Theocritus.

CREED. In general, a form of belief, from the Lat. *credo* (I believe), the first word of the Apostles' and Nicene creeds. The word, however, has received a variety of meanings. It signifies the entire body of beliefs held by the adherents of a given religion; in this sense it is equivalent to *doctrine* or to *faith*. In a somewhat narrower sense a creed is a summary of the principal articles of faith professed by a Church or a community of believers. Thus by the creeds of Christendom are understood the formulations of the Christian faith which have been drawn up at various times.

The Apostles' and Nicene Creeds, together with the Athanasian Creed, are the most ancient authoritative Christian creeds, though numerous ancient formularies of faith are preserved in the writings of the early fathers, Irenæus, Origen, and Tertullian, which agree in substance, though with some diversity of expression. The Nicene Creed was so called from being adopted as the creed of the Church at the Council of Nicæa or Nice, A.D. 325, though its terms were subsequently somewhat altered. The Apostles' Creed probably dates from the end of the fourth century; but there is no evidence of its being accepted in its present form till the middle of the eighth. The Athanasian Creed was certainly not drawn up by St. Athanasius, but probably belongs to the fifth century, if not as late as the end of the eighth or beginning of the ninth century.

In addition to these three creeds, the Roman Catholic Church has the creed of Pius IV., put forth in 1564, and consisting of the Nicene Creed with additional articles adopted by the Council of Trent, to which is now added a profession of belief in the definitions of the Vatican Council. The English Church adopts as "thoroughly to be received and believed" the three ancient creeds, which as part of her liturgy may be read in the *Book of Common Prayer*, but does not consider any of them to be inspired. Besides these creeds, there are numerous Confessions of Faith, which have been adopted by different Churches and sects. The Thirty-nine Articles of the *Book of Common Prayer* from a confession of faith for the Anglican Church. The creed of the Church of Scotland and other Presbyterian Churches is contained in the *Confession of Faith*, drawn up by the Westminster Assembly of Divines, and completed in 1646.—BIBLIOGRAPHY: Schaff, *Creeds of Christendom*; J. Pearson, *Exposition of the Creed*; S. G. Green, *The Christian Creed and the Creeds of Christendom*; W. A. Curtis, *History of Creeds*.

CREEDMORE. A station on the Long Island railway, 11 miles east of the city of New York. It has a celebrated rifle-range.

CREEK. A small inlet, bay, or cove; a recess in the shore of the sea or of a river. In America and Australia the term is often applied to a small river or rivulet.

CREEKS. A confederacy of Indian tribes formerly in Georgia and Alabama, but now planted in the Indian Territory, incorporated since 1907 into the new state of Oklahoma. The number of warriors used to amount to about 6000, but altogether the Creeks proper do not now exceed 7000. The dominant tribe is the Maskoki, who constitute about one-

half of the whole body. They have made considerable progress in agriculture, and raise horses, cattle, poultry, and pigs, and cultivate tobacco, rice, and corn.

CREEPERS. A family (Certhiidæ) of birds which strongly resemble the woodpeckers in their habit of creeping on the stems of trees with the aid of the strong quills which project from the tail-feathers, and of securing their insect food by an exsertile tongue. The common creeper (*Certhia familiāris*) is European, but is represented by American species. It is a pretty and interesting little bird, which builds its nest usually in holes or crevices of trees. The wall-creeper (*Tichodrŏma muraria*) of

Tree Creeper (*Certhia familiaris*)

Southern Europe searches for its insect food on rocks. The family is found in all parts of the world.

CREFELD, or **KREFELD.** Town of Germany. It stands near the Rhine, 32 miles from Cologne. Its importance dates from the seventeenth century, when religious persecution drove to it Calvinists from Berg and Julich, who introduced the manufacture of linen. With the introduction from Holland of the silk industry in the next century, the town rapidly became prosperous, and it is now famous for its silk and velvet manufactures. It also produces a great quantity of engineering products and chemicals. Crefeld is an important railway junction. Pop. (1930), 159,064.

CREIGHTON (krā'tun), **Mandell,** English bishop and historian, born 1843, died 1901. He was educated at Durham Grammar School and Merton College, Oxford, had a distinguished academical career, was fellow and tutor of his college, took orders, and was vicar of Embleton, Northumberland, for nine years. In 1884 he was appointed Dixie professor of ecclesiastical history at Cambridge, in 1891 was appointed to the see of Peterborough, and in 1897, on Dr. Temple's promotion to the archbishopric of Canterbury, became Bishop of London. His chief work is *History of the Papacy during the Reformation* (5 vols., 1882-94). He also wrote: *Life of Simon de Montfort, The Age of Elizabeth, The Tudors and the Reformation, Life of Cardinal Wolsey*; and *Historical Essays and Reviews, and Thoughts on Education,* edited by his wife, who wrote not a few biographical and historical works, including *Life and Letters of Mandell Creighton.*

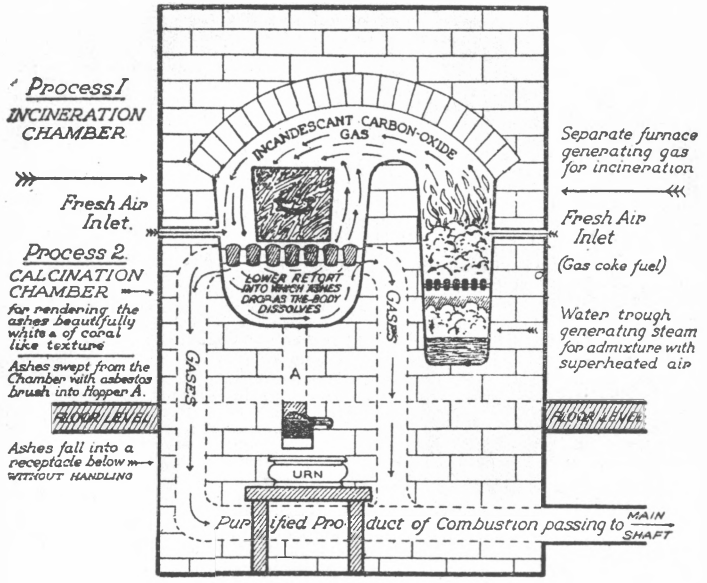
CREIL (krāy). A town of France, department of Oise, on the River Oise, an important centre of trade and industry, with railway workshops and manufactures of iron goods, pottery, and glass. It was occupied by the Germans in 1914. Pop. 10,560.

CREMA. A fortified city of Northern Italy, province of Cremona, on the Serio, 25 miles E.S.E. of Milan; pop. 11,900. It contains a cathedral and picture-gallery.

CREMA'TION. The burning of the bodies of the dead, a practice which was frequent in ancient times instead of burial, and which is now advocated on hygienic grounds by many scientific men in Europe and America on account of the dangers to the living caused by the presence of graveyards and cemeteries. The campaign opened in Italy, the first attempts being made by Brunitti, at Padua, in 1873. Numerous societies were founded after this, at Dresden, Zurich, London, and Paris. The Church has opposed cremation from the beginning, but many of the arguments against this practice are drawn from medico-legal sources.

Various methods of cremation have been proposed, the great difficulty being to consume the body without permitting the escape of noxious exhalations, and without mingling the ashes with foreign substances. In Siemens' process, a modification of a plan of Sir Henry Thompson, this is successfully accomplished. *See* BURIAL.—BIBLIOGRAPHY: A. G. Cobb, *Earth-burial and Cremation*; A. C. Freeman, *Cremation in Great Britain and Abroad.*

CREMO'NA. A city of Italy, capital of province of the same name, on the left bank of the Po, 47 miles S.E. by E. of Milan. It is surrounded


Process 1
INCINERATION CHAMBER
Fresh Air Inlet.
Process 2.
CALCINATION CHAMBER
for rendering the ashes beautifully white & of coral like texture
Ashes swept from the Chamber with asbestos brush into Hopper A.
FLOOR LEVEL
Ashes fall into a receptacle below WITHOUT HANDLING
INCANDESCANT CARBON-OXIDE GAS
LOWER RETORT INTO WHICH BONES DROP AS THE BODY DISSOLVES
GASES
GASES
A
URN
Purified Product of Combustion passing to MAIN SHAFT
Separate furnace generating gas for incineration
Fresh Air Inlet
(Gas coke fuel)
Water trough generating steam for admixture with superheated air
FLOOR LEVEL

Sectional Drawing showing Process of Cremation

by walls and wet ditches, its circumference being nearly 5 miles. The most remarkable edifice is the cathedral, begun in 1107 and completed about 1491. It is noted for its façade in alternate courses of red and white marble. Close by, and connected with the cathedral, is the Torazzo, built in 1283 as a peace monument, and one of the loftiest and most beautiful towers in Italy. Cremona is the seat of a bishopric, and has considerable manufactures of silk, wool, and cotton. It was at one time celebrated for its violins, especially those made by Antonius Stradivarius, Joseph Guarnerius, and members of the Amati family. Pop. 64,023. The province has an area of 685 sq. miles, and a pop. of 364,668.

CRENELLE (krė-nel'). An embrasure in an embattled parapet or breastwork. The adjective *crenellated* is applied in architecture to a kind of embattled or indented moulding of frequent occurrence in buildings of the Norman style.

CRE'OLE (Sp. *criollo*). The name which was originally given to all the descendants of Spaniards born in America and the West Indies. It is now used in a wider sense to signify the descendants of Europeans of any nation born in South America and the West Indies, as well as in some other localities. The French Canadians are never termed Creoles, nor is the word now used of the South Americans of Spanish or Portuguese descent. In Mexico, however, whites of pure Spanish extraction are still called creoles. *Creole dialects* are those jargons which have originated from the mixture of different languages in the West Indies or Southern United States, and are spoken by the descendants of the slaves. According to the European language which prevails in a Creole dialect it is called *French Creole, Spanish Creole*, etc.

CREOSOTE. A mixture of substances obtained by distilling wood-tar or coal-tar. The products from the two kinds of tar should be carefully distinguished from each other. Coal-tar creosote is another name for the heavy or creosote oils which distil over between 230° and 270° C. (*See* COAL-TAR DISTILLATION.) Wood-tar creosote comes chiefly from beechwood. The process is somewhat elaborate, involving treatment of the original distillate by caustic soda and sulphuric acid. In the final distilla-

tion the fraction which passes over between 200° and 220° C. is wood-tar creosote. It is a highly refractive, colourless, oily liquid. It was first obtained in 1832. Not long afterwards carbolic acid was found in coal-tar, and for some time the two substances were thought to be the same. They are easily distinguished from each other, however, by the solubility of carbolic acid in glycerine. Wood-tar creosote is a mixture of various compounds, chiefly guaiacol, creosol, and phlorol. Beechwood creosote, or the guaiacol derived from it, is a valuable medicine in respiratory diseases, and is often useful in toothache. Smoked hams probably owe a good deal of their flavour to the volatile antiseptic creosote which rises with the smoke of the burning wood.

CRESCENDO (kre-shen'dō), or **CRES.** (Italian). A musical term signifying that the notes of the passage over which it is placed are to be gradually swelled. Crescendo passages are marked < signifying piano to forte; the corresponding mark > diminuendo, marking the transition from forte to piano.

CRES'CENT (Lat. *crescens*, growing). An emblem representing the moon in its first quarter. This emblem is of very high antiquity, being that of the Greek goddess Artemis or Diana. It is found on medals of many ancient cities, particularly of Byzantium, from whence it is supposed to have been borrowed by the Ottomans. Since their establishment in Europe it has been the universal emblem of their empire. The crescent has given name to a Turkish order of knighthood with a crescent-shaped badge, instituted by Selim, Sultan of Turkey, in 1801.

CRESCENTIA. A genus of tropical trees, nat. ord. Bignoniaceæ. *C. Cujête* is the calabash tree. It is cauliflora, i.e. the flowers and fruits are borne on the old wood; it is also an example of water-calyx.

CRESPI, Giuseppe Maria. Italian painter of the Bolognese school, called *Lo Spagnuolo* from his fondness for rich apparel, born at Bologna in 1665, died 1747. He had many scholars, among whom were his two sons Antonio and Luigi Crespi. The latter distinguished himself by his writings on painting. His greatest work, a *Massacre of the Innocents*, is at Bologna. Crespi is also known as an engraver.

CRESS. The name of several species of plants, most of them of the nat. ord. Cruciferæ. Watercress, or *Nasturtium officinăle*, is used as a salad, and is valued in medicine for its antiscorbutic qualities. The leaves have a moderately pungent taste. It grows on the brinks of rivulets and in moist ground.

Watercress (*Nasturtium officinale*)

Common garden cress is the *Lepidium sativum*; Normandy cress, *Barbarea præcox*; winter cress, *B. vulgăris*; Indian cress, *Tropæ̆olum majus*; bitter cress, *Cardamīne pratensis* (cuckoo-flower).

CRESSELLE (kre-sel'; Fr. *crécelle*). A wooden rattle used in some Roman Catholic countries during Passion Week instead of bells, to give notice of divine worship.

CRESSET. A name which appears to have been given in the Middle Ages and later indifferently to the fixed candlesticks in great halls and churches, to the great lights used as beacons and otherwise, and to lamps or fire-pans suspended on pivots and carried on poles in processions or by municipal and military watches.

CRESSY. *See* CRÉCY.

CREST (Lat. *crista*). The plume or tuft of feathers, or the like, affixed to the top of the helmet. In heraldry the crest is a figure originally intended to represent the ornament of the helmet, but is now generally placed upon a wreath, coronet, or cap of maintenance, above both helmet and shield. The crest is considered a greater criterion of nobility than the

coat of arms itself, and it is now commonly a piece of the arms. It is to the crest that in heraldry the name *cognizance* is properly given. The first crest to be met with in the monuments of English chivalry is that on the great seal of Richard Cœur de Lion. About the time of Henry III. crests came into general use.

CRESTA RUN. Artificial snow-covered track at St. Moritz, Switzerland. Constructed in 1884, it is reconditioned annually for winter sports. About 1350 yds. long, its steeper curves are banked up. Steel bobsleighs and skeletons are used on it, and it is a famous sporting track.

CRESWELL CRAGS. Caves in Derbyshire, famous for their antiquarian remains. They are about 9 miles from Chesterfield. In them implements used by primitive man and some of his drawings have been found. Excavations here were begun in 1924, and in 1930-31 important remains of early man were found in the Pin Hole cave.

CRESWICK (kres'ik), **Thomas.** English landscape painter, born 1811, died 1869. He was elected an associate of the Royal Academy in 1842, and R.A. in 1851. His first pictures were admitted into the academy exhibition when he was only in his seventeenth year, and his success was afterwards continuous. Among his great works are: *England, London Road a Hundred Years Ago,* and *The Weald of Kent.*

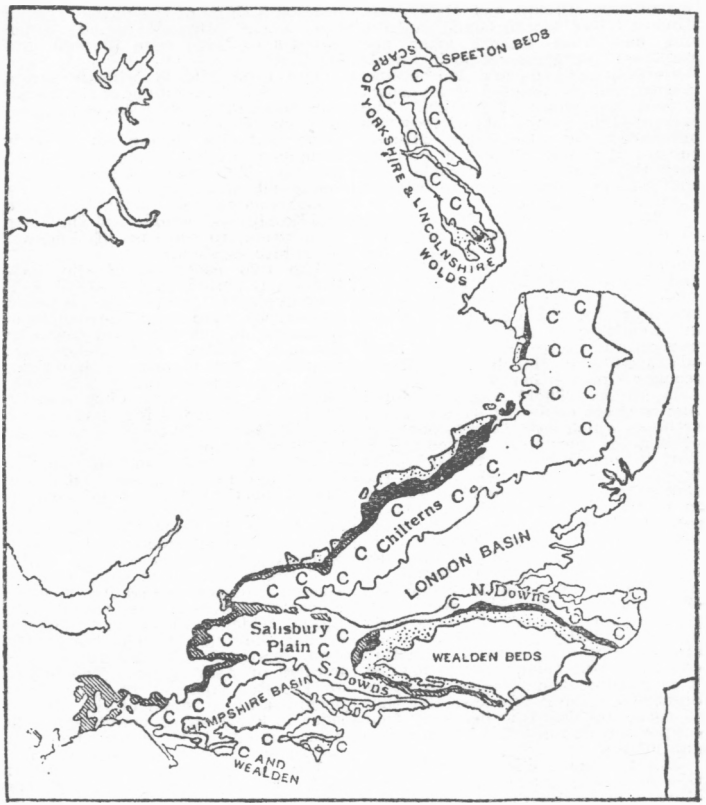
CRETA'CEOUS (or **CHALK**) **SYSTEM.** In geology, the highest system of the Mesozoic group of strata, between the Jurassic and the Eocene systems. The name is derived from the frequent occurrence of the soft white limestone known as chalk (*creta,* or Cretan earth). The Upper Cretaceous series in England and N.W. France consists, indeed, largely of chalk, with clays and sands below. Cretaceous sands are often rich in glauconite (greensands), and the following upward sequence has been established in S.E. England: Wealden beds (lacustrine), Lower Greensand, Gault Clay, Upper Greensand, Lower, Middle, and Upper Chalk. Continental geologists include in the Lower Cretaceous series all strata up to the top of the Gault. English geologists often combine the Gault and Upper Greensand as a basal member of the Upper Cretaceous series under the name of Selbornian. The Cretaceous strata are more complete as a continuous marine system in S.E. France. In the United States the highest beds contain the last terrestrial dinosaurian reptiles, still of great size; and Mosasaurus, a huge marine reptile, occurs in the uppermost chalk of Europe. The mammals, despite their rapid spread in the succeeding Eocene times, remain little removed from the humble types of the Jurassic period.

CRETE, or **CANDIA** (in the Turkish language *Kirid*). An island in the Mediterranean, 81 miles from the southern extremity of the Morea and 30 miles from the African coast, 160 miles long, 14 to 50 miles broad; area, 3195 sq. miles. High mountains, covered with forests, run through the whole length of the island in several ranges. On the north side the island declines moderately to a fertile coast, provided with good harbours; on the south side steeply to a rocky shore, with few roadsteads; and it reaches its greatest height in Psiloriti (the ancient *Ida*), 8193 feet high, and always covered with snow. Numerous springs give fertility to most of the valleys, in which, and on the declivities of the mountains, is seen a luxuriant vegetation.

The air is mild; the summer is cooled by the north winds; the winter is distinguished only by showers of rain. The island might therefore supply, as formerly, a much larger population than at present with grain, wine, and oil, wool, flax, silk, and cotton, fish, honey, game, cattle, fruits, and even with metals in abundance. But agriculture is greatly neglected, while education and the amenities of civilized life have made little progress, though there is now promise of better things. Harbour works and railways are projected, but the commerce and manufactures of the island are unimportant.

The inhabitants (estimated at 1,200,000 in ancient times) now number about 386,427, of whom two-thirds are Greek Christians (rapidly increasing), and about one-sixth Turks. The capital, Canea, the chief place of trade, has 24,604 inhabitants.

History.—The island, colonized at a very early period by Egyptians and Anatolians, was the dominant power in the Ægean world and the centre of the so-called *Minoan* or *Ægean* civilization (see next article). At one time a republic, it became the seat of the Cilician pirates till conquered by the Romans, from whose hands it passed in 823 to the Saracens, and then to the Greeks again in 962. In 1204 the Byzantine sovereign sold it to the Venetians, who held it until the second half of the seventeenth century, when the Turks conquered it after a desperate



Map showing Distribution of Cretaceous Strata in England

Lower Greensand series, dotted; Gault clay, black; Upper Greensand (mostly sandy beds of Gault age), shaded with oblique lines where not too thin to be represented; Chalk (usually marly at base) marked C.

struggle and the siege of the capital for no less than twenty years. Insurrections against Turkish rule have more than once occurred; a formidable one fomented by Greece in 1868 was with difficulty suppressed after a tedious conflict. In 1877 another insurrection broke out, followed by a declaration of union with Greece in 1878. The inhabitants were pacified by the concession of self-government by Mukhtar Pasha; but religious differences gave rise to new troubles in 1884, 1889, and 1895. At last in 1897 Greece directly interfered, and a short war broke out with Turkey, in which Greece was worsted. Crete, although autonomous, remained under the suzerainty of Turkey until 13th May, 1913, when it was ceded to the Balkan powers. By the Treaty of London, Turkey renounced all sovereignty over the island, and its union with Greece was formally recognized by the Treaty of Bucharest, 10th Aug., 1913. *See* GREECE.—BIBLIOGRAPHY: J. H. Freese, *A Short Popular History of Crete*; H. F. Tozer, *The Islands of the Ægean*; Victor Bérard, *Les Affaires de Crete*; Sir Arthur Evans, *Palace of Minos*.

CRETE, Ancient Civilization of. Crete was the "cradle" of pre-Greek or Ægean civilization, which has

two phases, Minoan and Mycenæan. Minoan refers to the island culture, and has been named after the legendary lawgiver Minos; while Mycenæan has been so called because it is so well represented at Mycenæ; it is a late phase of Minoan. The culture of the second city of Troy was influenced by the early Minoan culture of Crete. Traces of contact with Egypt at various periods have enabled the archæologists to frame a chronological system.

Crete passed from its Age of Stone to its Bronze Age about 3000 B.C. Its early settlers had reached the island before metal came into use, and they visited the island of Melos, where they worked obsidian, flakes and knives of which have been found in Neolithic strata. The art of navigation must have been well advanced before the obsidian workers reached Crete either from Egypt or Asia Minor. There was no Copper Age in Crete or Troy; those copper artifacts which have been found were of religious character. As the transition to metal was a transition to bronze, the influence that caused the change must have come from an area in which tin was obtained, that is, somewhere in Mid-Asia. The copper found by the ancient Egyptians in Upper Egypt and Sinai was naturally hard, but the copper found in Armenia and Persia by the Sumerians of ancient Babylonia was soft. Bronze came into use at a very early period in Babylonia, and as there are undoubtedly traces of Sumerian culture in Mid-Asian prehistoric sites, it is possible these began to be as Sumerian mining colonies, and that to these are due the discovery that copper can be hardened by an amalgam of tin.

Minoan Age.—With the introduction of bronze into Crete began the Minoan Age, which has been divided into three periods—Early Minoan, Middle Minoan, and Late Minoan. Each of these periods has in turn been subdivided into First Early Minoan, Second Early Minoan, Third Early Minoan, First Middle Minoan, Second Middle Minoan, and so on to the Third Late Minoan period. Early Minoan II. was parallel with the sixth dynasty of Egypt, and is dated *c.* 2500 B.C.; Middle Minoan II. was parallel with the twelfth dynasty of Egypt, and is dated *c.* 2000 B.C.; and Late Minoan II. was parallel with the eighteenth dynasty of Egypt, and is dated *c.* 1500 B.C. Late Minoan III., which began about 1450 B.C., came to an end about 1200 B.C., and was succeeded by the Homeric Age, when Mycenæ and Tiryns rose into prominence and the supremacy of Crete became a thing of the past. During the Early Minoan period, Crete appears to have been divided into small states.

The First Middle Minoan period begins with the building of the earlier palaces at Phæstos in the south, and Knossos in the north. After about three centuries, during which trade flourished, a climax occurred at both palaces. The palace of Knossos was destroyed about 2000 B.C. A new palace was erected during the Third Middle Minoan period, and the town of Gournia, to the east of Knossos, came into existence.

The two centuries of the Late Minoan I. period (*c.* 1700-1500 B.C.) were evidently prosperous. Knossos appears to have been the centre of government, but the little towns of Gournia, Zakro, and Palaikastro flourished, and it may be that these were semi-independent. The Late Minoan II. period, which began about 1500 B.C. and lasted for about half a century, is usually referred to as the "Golden Age of Crete."

Knossos, situated in proximity to Candia and in the richest part of the island, was the chief centre of government. Its palace was remodelled, and about the same time the small towns already referred to were sacked. Mycenæ and Tiryns on the mainland began about the same time to assume importance as trading centres. Knossos increased its trade with Egypt, which became very powerful during the reign of Thothmes III., who extended its empire to the borders of Asia Minor. The palace at Phæstos appears to have been occupied by a vassal of the Minoan ruler at Knossos. A convulsion took place about 1400 B.C., when the palace of Knossos was sacked.

The available evidence suggests that the Mycenæans invaded the island, and, with the aid of the Achæans, brought the dynasty of Minos to an end. Large numbers of Cretans appear to have migrated. A colony of them settled in Cyprus, and it may be that the classical legend of the expedition of Minos to Sicily, and the subsequent Cretan expedition to avenge his death, refer to attempts made to found colonial settlements in Sicily and Italy. Cretan settlers also reached Palestine, Tyre, and Sidon. The subsequent rise of Phœnician sea-power may have been due in some measure to the influence of Cretan refugees.

During the Late Minoan III. period, the palace of Knossos was partially restored and reoccupied, and trade revived in the small towns of Gournia and Palaikastro. But the native art and industries of the island suffered

steady decline, and the King of Crete who fought in the Trojan War was evidently subject to Mycenæ. It is of interest to note in this connection that, according to Greek tradition, Pelops, who founded the House of Agamemnon, came from Asia Minor. He may have belonged to one of the groups of warlike peoples in the Hittite Confederacy. The Pelopids became the overlords of the Achæans, of the Cretan colonists at Mycenæ, and of the other inhabitants of ancient Greece

Cretan Art.—Cretan civilization was a brilliant one, worthy to be classed with that of Egypt or Babylonia. Its palaces were as great achievements in architecture as the temples of Egypt. One of their remarkable features is a wonderful drainage system, with quite modern conveniences. A high degree of excellence was attained in art and especially in stone-carving and jewellery. Vases of steatite, alabaster, and marble were worked as thin as modern china. Ivory figures were carved with exquisite skill. The pictorial art, as revealed by frescoes, has a lyrical freedom and realism which strikes quite a modern note. Animals in plaster relief, carved in steatite or moulded in faience, are artistic achievements of the first order. The note of modernity is found even in female fashions. Cretan ladies wore bell-mouthed or flounced skirts with tightened waists, and look more like ladies of our Victorian period than those of the Hellenic Age.

Trade.—The prosperity of Crete was based on the seafaring mode of life. The Minoans were the earliest traders on the Mediterranean, and traces of their activities have been found as far westward as Spain, and as far eastward as the shores of the Black Sea. A regular trade was maintained with Egypt and the Syrian coast and with Troy.

Religion.—Not much is known regarding Cretan religion, as the inscribed tablets have not yet been deciphered. The chief divinity appears to have been the mother goddess who had links with Rhea, Demeter, Athena, and Aphrodite. Offerings were made to her in cave sanctuaries. The dove and serpent were connected with her cult. There was also a group of three goddesses. A double-axe symbol of a deity was honoured, and in late times it was connected with the son of the mother goddess, the "Cretan Zeus" or "Zeus of the Double-axe." The legendary ruler, Minos, became after death a judge of the dead, like the Egyptian Osiris. That there were Libyan and Egyptian elements in Cretan religion appears to be undoubted. Early culture mixing and the process of local development have, however, obscured Cretan religious phenomena, and raised problems that must remain unsolved until the texts are deciphered.—BIBLIOGRAPHY: Sir Arthur Evans, *Scripta Minoa*; *Reports on the Excavations of the Palace of Knossos*; Captain Spratt, *Travels and Researches in Crete*; R. M. Burrows, *The Discoveries in Crete*; H. B. Hawes, *Crete the Forerunner of Greece.*

CRET'INISM. A form of idiocy, due to defective action of the thyroid gland in infancy. An analogous condition, known as myxœdema, may develop in the adult if the thyroid gland is destroyed by disease or injury. The disease seems to be endemic, and largely confined to valleys of mountainous regions. Cretins are usually affected with goitre. They are ill grown and stunted, with swollen bellies. The skin is coarse, head large, the nose sunken and flattened at the bridge, the lips thick, chin protruding, mouth wide and gaping, the tongue large. The countenance is dull and heavy; there is general muscular weakness and slowness of sensibility. Associated with these are feebleness or want of intellect, varying in degree from absolute vacuity to a certain power of acquiring a little knowledge; sometimes deafness and dumbness, perhaps squinting and blindness. Careful training may do much for them, along with good food, cleanliness, and exercise; but the only treatment that effects any real improvement is the provision of the thyroid secretion, the lack of which is the cause of the trouble. This can be done by feeding the cretin on extracts made from the thyroid glands of sheep or other animals.

CREUSE (kreuz). An inland department, France, comprising most part of the old province of Marche; area, 2163 sq. miles. It derives its name from the River Creuse, which rises in it, and traverses it diagonally in a north-west direction, afterwards flowing on to join the Vienne. The surface is generally rugged, and the soil by no means fertile. Pop. (1931), 207,882.

CREUZER (kroi'tsĕr), **Georg Friedrich.** German philologist and archæologist, born 1771, died 1858. For nearly forty-five years he filled the chair of philology and ancient history at Heidelberg. He wrote on the mythology of Greece and other nations, on Greek history and literature, and on Roman antiquities.

CREUZOT (kreu-zō), **Le.** A town of Eastern France, department of Saône-et-Loire, 14 miles from Autun, with extensive ironworks, the most complete in France, turning out yearly 200,000 tons of iron and steel articles. The mining of coals, the smelting of iron, and the manufacture of machinery give employment to about 20,000 workmen in the town and vicinity, the greater number belonging to the works of Schneider & Co. Pop. 32,034.

CREVASSE. Fissure or crack. In glaciers deep chasms may form in the ice-substance when traversing uneven beds. The open top may be concealed by ice or snow bridges; mountain climbers should always be roped to at least one companion when traversing glaciers.

CREWE, Robert Offley Ashburton Crewe-Milnes, First Marquess of. British statesman, born 1858. Educated at Harrow and Trinity College, Cambridge, he was Lord-Lieutenant of Ireland from 1892-95, Lord President of the Council from 1905-8, and Secretary of State for the Colonies from 1908-10. He became Secretary of State for India in 1910, and when Mr. Asquith formed the Coalition Government in 1915, Lord Crewe joined the Cabinet as Lord President of the Council, but resigned with his chief in Dec., 1916. He was made an earl in 1895, a K.G. in 1908, and created a marquess in 1911. He has been chairman of the L.C.C. since 1917.

CREWE (krō). A municipal borough of England, in Cheshire, 21 miles S.E. of Chester, an important railway centre, and the seat of enormous manufactories of railway plant. It is quite a modern town, well laid out, and chiefly inhabited by people connected with the railways. It has a commodious market hall, a corn exchange, mechanics' institution, and town hall. Since 1918 it gives its name to a parliamentary division of the county. Pop. (1931), 46,061.

CREWKERNE (krō'kėrn). A town of England, in Somersetshire, 19 miles S.E. of Taunton; it manufactures sail-cloth. Pop. (1931), 3509.

CRIB'BAGE. A favourite English game at cards played with the whole pack. It seems to have been invented by Sir John Suckling (1609-42). The game may be played by two, three, or four persons; and when by two, five or six cards may be dealt to each. Five-card cribbage played by two persons is the most scientific game. Sixty-one points make the game; there are no tricks and no trumps, the object being to make *pairs, fifteens, sequences,* or the *go,* or prevent the adversary from doing the same. Court cards and tens count as ten each, and all the rest count for the number of "pips" upon them. Every *pair,* that is, every couple of cards of the same value belonging to different suits (two aces, two fours, two kings, etc.), counts two; and when there are three or four similar cards, as many pairs are counted as there are different combinations of the cards taken two at a time. Every combination of cards, the united pips of which make up fifteen, counts two. A sequence consists of three or more cards of any suit following one another in rank, and counts one for each card. When the player whose turn it is to play cannot play a card without going beyond thirty-one, the other player scores one for having been the nearest to thirty-one. This is called scoring one for "the go." The remaining cards after thirty-one, or the next point to it, is made, are thrown up, and each player's cards are counted. When all the cards in a hand, either with or without the turn-up card, are of one suit, or when all the cards in the crib, with the turn-up card, are of one suit, it is called a *flush,* and counts one for each card. When the turn-up card is a knave, the dealer scores two ("two for his heels"). When a knave of the same suit with the turn-up card is found in the hand of either player, the player in whose hand it is scores one ("one for his nob").

CRICCIETH (krik'eth). An old town, parliamentary borough (Carnarvon district of boroughs), and watering-place of Wales, Carnarvonshire, on Tremadoc Bay, the northern portion of Cardigan Bay, with fine scenery and other attractions adjacent. There are extensive ruins of an old castle. Pop. (1931), 1449.

CRICHTON (krī'ton), **James,** surnamed the *Admirable.* A Scottish celebrity, son of Robert Crichton, Lord Advocate, was born in 1560, died about 1585 or 1586. He was educated at the University of St. Andrews, and, according to the current accounts of him, before his twentieth year had run through the whole circle of the sciences, could speak and write to perfection ten different languages, and was equally distinguished for his skill in riding, fencing, singing, and playing upon all sorts of instruments. He visited Paris, Genoa, Venice, and Padua, challenging all scholars to learned

disputations, vanquishing doctors of the universities, and disarming the most famous swordsmen of the time in fencing. He was afterwards tutor to a son of the Duke of Mantua, and is said to have been stabbed to the heart in a dastardly manner by his pupil. The story of his achievements seems to be rather highly coloured; but he was extravagantly praised by Aldus Manutius, the printer of Venice, to whom he was well known. The epithet "admirable" for Crichton first occurs in John Johnston's *Heroes Scoti* (1603). He left some Latin poems, possessed of no remarkable quality.—Cf. Douglas Crichton, *The Admirable Crichton: the Real Character*.

CRICKET. An insect of the genus Gryllus, or Achēta of some naturalists, ord. Orthoptera. There are several species. The house-cricket is the *Achēta* (*Gryllus*) *domestica*; the field-cricket is the *Achēta* (*Gryllus*) *campestris*; the mole-cricket is the *Gryllotalpa vulgāris*. The house-

House-cricket (*Acheta* (*Gryllus*) *domestica*)

cricket of Europe is about an inch long, with antennæ of about an inch and a half, of a pale-yellowish colour mixed with brown. By the friction of the peculiarly formed wing-covers the males produce that stridulous sound by which these insects are so well known, and which has become associated with ideas of cheerful domestic comfort. They live in holes and crevices near fire-places or in other warm situations, whence they come out at night to feed on crumbs and other fragments of food. The field-cricket makes a similar noise. The house-cricket has been introduced into the United States, and there are several species of field-cricket there also. *See also* MOLE-CRICKET.

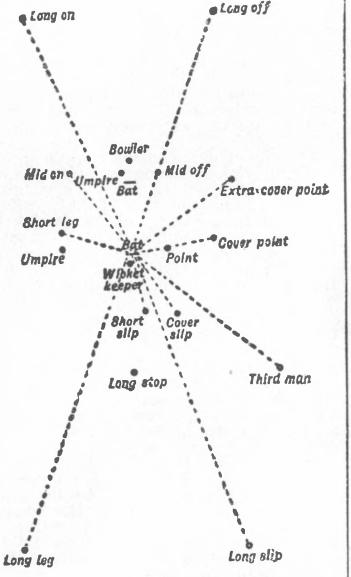
CRICKET. Manuscripts are extant which show that a game somewhat resembling cricket was in existence in the thirteenth century, probably in the form of what is now known as the single-wicket game. The actual term *cricket* is of dubious etymology; it cannot, in fact, be traced back beyond the latter half of the seventeenth century. Authorities are not prepared to accept the rather obvious Anglo-Saxon derivative *crycc*, a stick. But there can be no doubt that at this period a game bearing a substantial resemblance to the modern double-wicket form was in existence, and the distance of 22 yards was already standardized, although originally no stumps were used. At a later date two were employed, a third being added in 1775 to occupy the width between the original two. Such modifications as have occurred since that date are of a comparatively trivial character, the fundamental rules and regulations are not likely to be altered at any future date, although even at the present certain details come up for consideration, particularly in adaptation to exigencies which may arise.

M.C.C.—The central governing body of cricket throughout the world is the Marylebone Cricket Club, known always as the M.C.C., with headquarters at Lord's Cricket Ground, St. John's Wood Road, London; established in its present situation in 1814. Whilst the traditional eleven a side obtains in the huge majority of cases, occasionally a strong eleven competes against a much larger team, even up to twenty-four.

The remarkable universality of the game renders a detailed description superfluous; the smallest village in the kingdom, one might almost say in the empire, possesses its cricket club, and nobody with a desire to become acquainted with the general principles of the game need deplore the lack of opportunity to become familiarized. Practically the only alteration within comparatively recent date has been the institution of the six-ball over, originally four, and extended in 1889 to five. From time to time attempts have been made in the direction of such an alteration as increasing the height and width of the stumps, in order to reduce the advantage in favour of the batsman, but such proposals did not receive official encouragement till 1929, when both height and width were increased by one inch. In 1919 the two-day match was instituted, but found to be a complete failure, and in the following season a return to the original three-day match was resumed.

It has been mentioned that every village possesses a cricket club, and in this country the cricket season—May to September—witnesses an enormous number of contests between clubs, schools, colleges, universities, and counties, with such

exceptionally selected teams as representatives of the best amateurs against the best professionals ("Gentlemen *v.* Players"), and in alternate years the great international contests afforded by the visit of an Australian team. It is impossible to enumerate the large number of important clubs whose members constitute strong elevens. An exception, however, must be made in favour of the I Zingari Club, founded in 1845.



Cricket Field as set for Fast Bowling

Any one of the positions, long on, extra cover point, long slip, short leg, or long stop may be occupied by the eleventh man.

To deal with first-class cricket only. This comprises matches between the counties selected as first-class, teams from Oxford and Cambridge, the Services, and the M.C.C. Whilst the last-named play a large number of matches with the first-class counties, the counties themselves engage in a special competition for the County Championship. In 1920 the following counties competed: Middlesex (champions), Lancashire, Surrey, Yorkshire, Kent, Sussex, Notts, Essex, Somerset, Hampshire, Warwickshire, Leicestershire, Northants, Worcestershire, and Derbyshire.

During the past twenty-five years the most successful counties have been Surrey and Yorkshire; but the fluctuating fortunes of the various counties is almost a platitude, depending so largely upon what players of note happen to be resident for that season, and upon the financial resources of the particular clubs in their ability to engage professionals. Thus Middlesex, the 1920 champions, were thirteenth in 1919. From time to time a second-class or minor county feels justified in seeking promotion to the first-class group, and a major county drops out.

The leading cricket schools are Eton, Harrow, Winchester, Repton, Tonbridge, Uppingham, Marlborough and these contribute the great mass of distinguished amateurs in first-class cricket. But the remarkable universality of the game offers opportunities to any boy of natural ability to appear in first-class games, either as an amateur or professional, and many striking examples of prominence out of obscurity can be quoted.

Lord's and the Oval.—London boasts two of the most important cricket grounds in the world, Lord's and the Oval. The latter is the headquarters of the Surrey County Cricket Club. Lord's is the venue of a large number of regular classic fixtures, e.g. Oxford *v.* Cambridge, Eton *v.* Harrow, Army *v.* Navy, contests between some of the great public schools, as well as the M.C.C. matches and the international matches. All the other counties have one or more large and important grounds.

"The Ashes."—Although an English team first visited Australia in 1862, it was not until 1878 that a representative Australian team toured this country. Since then, with very few exceptions, the cricket season has witnessed a continuance of the contests either here or in Australia. The remarkable success of the Australian team in 1882, principally owing to the skill of Spofforth "the demon bowler," led to the institution of the expression "the Ashes," in reference to the "death of English cricket," and the international contests are popularly described as the fight for "the Ashes." This is not strictly true, for in order to regain "the Ashes" a team must visit their successful rivals and beat them on their own grounds. In the British tour in Australia in 1928-29 there was no time limit to the games, each "Test" match being played to a finish—a method which aroused a great deal of controversy. This method has since been followed.

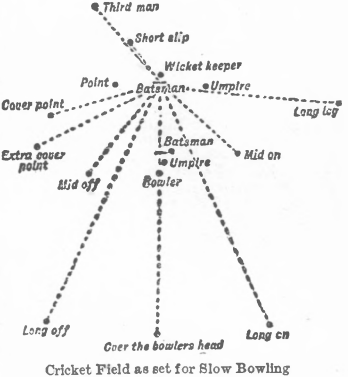
Britain lost the Ashes in 1930 but regained them in 1932-33. Of lesser interest are other matches of international character, such as contests with South African teams, Gentlemen of Philadelphia, and the West Indies. Tours in other parts of the world have taken place from time to time, but such teams as leave the country on such occasions are not international, but more in the nature of private ventures.

Statistics.—A few statistical details of first-class cricket may be of interest. The biggest hit ever recorded in cricket was 175 yards, measuring from the batsman's wicket to the place where the ball first pitched. The highest score of an English eleven in first-class cricket was 887 by Yorkshire against Warwickshire in 1896; the lowest, 12, by Northants against Gloucestershire in 1907. The highest individual score in first-class cricket was by D. G. Bradman, who scored 452 in the match New South Wales *v.* Queensland, at Sydney, 1929–30. A. E. J. Collins, a schoolboy, playing in a house match at Clifton in 1899, scored 628 not out, which ranks as the highest individual score in the history of the game. Tom Hayward, the Surrey professional, scored 3518 in the 1906 season, which is the greatest aggregate in first-class cricket in any one season. The record number of centuries up to July, 1932 (189), was made by J. B. Hobbs (Surrey), who on six occasions made two centuries in one match.

Students of the game can compile huge masses of statistics which are much too numerous to be mentioned here, such as the number of batsmen who have compiled a century in both innings of a first-class match, of bowlers who have performed the "hat trick" (3 wickets with consecutive balls), and even of taking all ten wickets during an innings of a big match.

From time to time one hears pessimistic views as to the decadence of cricket, the want of public interest, and so on. The enormous crowds frequenting the great matches is a testimony to the falsity of any opinion as to popular indifference. As to the question of comparison between the leading exponents of the present day and the giants of the past, opinion must be at all times discrepant, but there is one exception. It is universally held that the late W. G. Grace may justly rank as the greatest cricketer of all time. It is, however, the current opinion that the Surrey professional J. B. Hobbs may, with the exception of the great Gloucestershire amateur, rank as at least equal in excellence with any of his predecessors. Naturally, whatever part of the game is under consideration, any great modern cricketer has to undergo the ordeal of comparison with an enormous list of first-class performers, whose deeds were executed under conditions which cannot be strictly compared or contrasted with those obtaining at the present day. Perhaps the only striking modern development has been the institution of "googly" bowling, a peculiar scientific exposition of spin of the ball, the adoption of which created a sensation which has now become a commonplace of modern cricket.

A few words will suffice for the consideration of the single-wicket



Cricket Field as set for Slow Bowling

Any one of the positions, long leg, extra cover point, or over the bowler's head may be occupied by the eleventh man.

game, which is a curiosity of cricket history, and one which is never encountered nowadays. The rules governing such matches were naturally elastic, according to the number participating therein. Such freak matches as a man and a dog against two players are on record.—BIBLIOGRAPHY: C. Box, *English Game of Cricket*; A. G. Steel, Hon. R. H. Lyttleton, and others, *Cricket* (Badminton Library); W. A. Bettesworth, *Chats on the Cricket-field*; A. E. Knight, *The Complete Cricketer*; P. F. Warner, *The Book of Cricket*.

CRICKLADE'. A town of England, County Wilts, 40 miles N. of Salisbury. Pop. (1931), 1425. Until 1885 it returned two members to Parliament, but the parliamentary borough included between forty and fifty parishes.

CRIEFF (krēf). A burgh of Scotland, County Perth, beautifully situated on a slope above the Earn, backed by lofty hills and crags. The principal manufacture is woollens (shirtings, blankets, and tweeds). The environs of Crieff are singularly beautiful, and its climate is salubrious. Pop. (1931), 5544.

CRILLON (krē-yŏn). **Louis Balbis de Berton de.** Great French soldier of the sixteenth century, born in 1543, died 1615. He distinguished himself in five successive reigns—those of Henry II., Francis II., Charles IX., Henry III., and, above all, in that of Henry IV. He won renown at the capture of Calais, and in the battles of Dreux, Jarnac, and Moncontour (1569), against the Huguenots, and in the naval battle of Lepanto against the Turks. The massacre of St. Bartholomew was reprobated by him. He fought for Henry at Ivry against the Catholic League.

CRIME. A term used to indicate sometimes a violation of the higher moral law, sometimes more specifically the violation of a certain group of the laws formulated by a nation. This group properly comprises in its scheme all offences endangering the welfare of the community, as distinct from civil or private injuries, which are as between person and person, and terminate with the compensation of the injured. Crimes, therefore, vary in character with times and countries. That which at one time is denounced as a crime, at another, under different circumstances, is considered not only legal and permissible but even a meritorious act, deserving public gratitude. Hence from the legal point of view crime is sometimes defined as an offence punishable by law directly, as opposed to an offence which the law punishes indirectly by granting damages to the person wronged. (*See* CRIMINAL LAW.) Whether used in the legal or the moral sense crime implies freedom of will, the power of distinguishing between right and wrong, and a fulfilled intention. Hence, though the theoretic rule of common law is that all infraction of law is criminal and penal, it is held that young children, madmen, and idiots cannot commit crimes.

The prevention of crime may be effected in a threefold manner: by imposing a penalty which shall operate by fear to deter men from committing crimes, or by rendering it physically impossible for a man of known criminal tendency to repeat an offence, or by the reformation of the criminal. With the higher evolution of society the principle of retaliation has fallen into theoretic disrepute, though still a practical legal factor; and the problems of penology are made to turn almost exclusively upon the principle of prevention in these three aspects, and especially on the two last. The discovery that fear of a penalty only operated up to a certain point, beyond which an excessive punishment exercised a brutalizing tendency, has led to a large mitigation of penal severity accompanied by a wide desire for the abolition of capital punishment; while, on the other hand, various schemes have been devised for making punishment reformatory. These changes in criminal law date in a large measure from the publication of Beccaria's *Dei Delitti e delle Pene* (On Offences and Penalties) in 1764.

CRIME'A, The (ancient **Chersonēsus Taurica**). A peninsula of Southern Russia, forming an autonomous republic of the R.S.F.S.R. (*see* RUSSIA). It comprises the former districts of Perekop, Eupatoria, Simferopol, Yalta, and Feodosia. It is attached to the mainland by the Isthmus of Perekop; area, 9900 sq. miles.

On the west and south it is washed by the Black Sea, and on the east by the Sea of Azov, a portion of which, shut off by a strip of land, forms the Putrid Sea. Three-fourths of the Crimea belongs to the region of steppes, but the other part, confined entirely to the south, and stretching along the coast from west to east, abounds in beautiful mountain scenery. Here the valleys looking southward are luxuriant with vines and olive and mulberry plantations, while the northern slope gives a large yield in cereals and fruits. The climate, however, is unequal, and in winter is severe. The chief stream is the Salghir. Others of celebrity are the Tshernaya and the Alma. The most important of the productions, besides those already mentioned, are tobacco, of which a large quantity of excellent quality is produced, flax, and hemp. The forests are of limited extent. Fine-woolled sheep, cattle, and horses are extensively reared. Pop. (about) 761,600. Sebastopol, Eupatoria, and Feodosia are important towns.

History.—The country, anciently inhabited by the Cimmerians, later consisted of various Greek settlements and minor kingdoms. After being for some time a dependency on Rome, it was overrun by successive bodies of barbarians, and in 1237 fell

into the hands of the Mongols under Genghis Khan. About 1261 the Genoese were permitted to occupy and fortify Kaffa, and they rapidly extended their power in the formation of other settlements. They were expelled, however, in 1475 by Mahomet II., who made it a dependent khanate. In 1783 the Russians took possession of the country; and with the view of overawing the Turks the great naval arsenal of Sebastopol, occupying the most commanding position in the Black Sea, was begun by Catherine II. in 1786. Its military resources were steadily developed up to the time of the Anglo-French campaign (*see* CRIMEAN WAR) of 1854, when it fell into the hands of the Allies. In March, 1918, the Taurida Republic was proclaimed, to consist of Simferopol, Feodosia, Yalta, Eupatoria, Melitopol, Berdiensk, Perekop, and Dnieper.—BIBLIOGRAPHY: J. B. Telfer, *The Crimea and Transcaucasia*; Sir Evelyn Wood, *The Crimea in* 1854 *and* 1894; W. E. Curtis, *Around the Black Sea.*

CRIME'AN WAR. The struggle between England, France, and Turkey on the one hand, and Russia on the other, to prevent the undue preponderance of Russia in the east of Europe; 1854 to 1856. The old plans for the extension of Russian power conceived by Catherine II. and Potemkin were resuscitated by Nicholas I., who, believing that he had secured himself from interference on the part of Austria and Prussia, and that an Anglo-French alliance was impossible, prepared to carry them into action. Serbia, Bosnia, Bulgaria, and the principalities of the Danube were to become Russian protectorates, and Constantinople was to be provisionally occupied by Russian troops.

The first markedly aggressive step —the demand by Russia for a protectorate over the Greek Church throughout the Turkish Empire— brought matters to a crisis. An ultimatum presented by Menshikov in May, 1853, was rejected by the Porte; the Russians occupied the Danubian principalities; and war was declared by the Porte in October, 1853, by France and England in 1854, and by Sardinia in 1855. A French and English fleet entered the Baltic and captured Bomarsund and one of the Aland Islands, and in the south the Allies landed at Varna, under Lord Raglan and Marshal St. Arnaud as commanders-in-chief. While the Allies were making preparations Prussia and Austria demanded the evacuation of the Danubian principalities, and on evacuation being ordered by Nicholas, "for strategic reasons," the principalities were provisionally occupied by the Austrians.

It soon became obvious that the Crimea must be the seat of the war, and 50,000 French and English troops with 6000 Turks were landed at Eupatoria (Sept., 1854). Five days later the battle of the Alma was won by the Allies (20th Sept.), and the march continued towards the south side of Sebastopol. Soon after St. Arnaud died and was succeeded by Canrobert. The siege of Sebastopol was commenced by a grand attack which proved a failure, and the Russians under Liprandi retaliated by attacking the English at Balaklava (25th Oct.), but were defeated with heavy loss. It was at this battle that the famous, but useless charge was made by the Light Brigade.

A second attack at Inkerman was again repulsed by the Allies, but the siege works made slow progress during the winter, in which the ill-supplied troops suffered great privations. The death of Nicholas and succession of Alexander II., in March, 1855, brought no change of policy. Canrobert resigned in favour of Pélissier; and shortly after an unsuccessful attack on those parts of the fortifications known as the Malakov and Redan Lord Raglan died, and was succeeded by Simpson. The bombardment was continued, and in September the French successfully stormed the Malakov, the simultaneous attack on the Redan by the British proving a failure. The Russians, however, then withdrew from the city to the north forts, and the Allies took possession.

The chief subsequent event was the capture of Kars, in Asia, by the Russians after a splendid defence by the Turks under General Williams. By this time, however, the Allies had practical possession of the Crimea, and overtures of peace were gladly accepted. A treaty was accordingly concluded at Paris on 27th April, 1856, by which the independence of the Ottoman Empire was guaranteed. *See* PARIS, TREATY OF.—BIBLIOGRAPHY: A. W. Kinglake, *The Invasion of the Crimea*; Sir E. B. Hamley, *The War in the Crimea*; C. Rousset, *Histoire de la guerre de Crimée.*

CRIMINALITY. Legal criminality is not an inherent quality of actions, but may vary from country to country, and, even in one country, from generation to generation. Thus while in early times it was the

sacred right and duty of one who had suffered bereavement at the hands of another to seek out and slay the murderer, such an assumption of the functions of the law would now be a criminal act, and punishable as such. While actions, though immoral, may nevertheless not be criminal, so criminality may attach to actions in themselves perfectly moral. It is arbitrary, dictated by expediency. The essence of criminality is malice—evil intention—"dole," and such may be presumed from the consequences of the action. Generally speaking, if malice is wanting, criminality is wanting, and thus in certain circumstances it may be a good defence that the act was done under compulsion. The criminal is then the party compelling. Compulsion of want, though it may mitigate the penalty, is not an absolute defence. Ignorance of the law does not excuse, but error in fact may. Pupils and insane persons are incapable of "dole," and therefore of crime. Accession before the fact by advice, mandate, or help, may be criminal.

CRIMINAL LAW. The law relating to crimes. The general theory of the common law is, that all wrongs are capable of being looked at in two ways: first, civil or private wrongs or *torts*; secondly, criminal or public wrongs. The former are to be redressed by civil actions instituted by the parties injured. The latter are redressed by the State acting in its sovereign capacity. A private individual may institute a prosecution, but the penal consequences, if remissible at all, can only be remitted by the Crown. The general description of private wrongs is, that they comprehend those injuries which affect the rights and property of the individual and terminate there; that of public wrongs or offences being, that they comprehend such acts as injure not merely individuals but the community at large, by endangering the peace, the comfort, the good order, the policy, and even the existence of society. In the first, therefore, so far as the law is concerned, the compensation of the individual whose rights have been infringed is held to be a sufficient atonement; but in the second class of offences it is demanded that the offender make satisfaction to the community as having acted prejudicially to its welfare.

The exact boundaries between these classes are not, however, always easy to be discerned even in theory; for there are few private wrongs which do not exert an influence beyond the individual whom they directly injure. The divisions torts and crimes are thus not necessarily mutually exclusive, cases sometimes occurring in which the person injured obtains damages while at the same time the criminal is subjected to punishment not as against the individual but as against the State. It is moreover obvious that legal criminality is not in any strict sense a measure of the morality of actions though the legal enactment tends to enforce itself as a moral law. In large part it is only an approximate expression of the current sense of justice, this expression being both aided and hindered by the historical and constantly reflexive character of legal method.

The basis of the criminal law of Great Britain is to be found in the common law supplemented by parliamentary enactments of which many were passed in the eighteenth and nineteenth centuries. The law has been further added to by judicial decisions on the statutes. There is a division of crimes into treason, felonies, and misdemeanours; the distinctions between them are sometimes difficult to follow in the case of the two last. The distinction can only be clearly marked by an enumeration of the crimes arbitrarily assigned to each in the common law and judges' decisions. Even in severity of punishment a misdemeanour may rank as high as a felony.

The work of Royal Commissions in the nineteenth century resulted in the enactment of several important criminal statutes. A Draft Code was attached to the Report of the Criminal Code Commission which was published in 1879. In the twentieth century the Perjury Act, 1911, the Forgery Act, 1913, and the Larceny Act, 1916, are important consolidating statutes. The aim of criminal law as at present constituted is both retributive and preventive—in its former aspect being based upon the primitive passion of retaliation, in the latter primarily upon the fundamental instinct of self-preservation. It is the exercise of justice by a community or its representatives against an individual who is obnoxious to it or to any of its members. To some extent, however, punishment is also vengeance, the vengeance of society for its own preservation.

The twentieth century has witnessed great advances through the passing of two important statutes, the Probation of Offenders Act, 1907, and the Prevention of Crimes Act, 1908. The former enables the

court in view of the age, health, character, etc., of an accused person to suspend sentence and release the offender on probation for a period not exceeding three years, and so to avoid branding as criminal one who may have made but a temporary lapse. The Criminal Justice Act, 1925, and Amendment Act of 1926 also deals with the question of probation. The Prevention of Crimes Act, 1908, established a system of Borstal institutions for detention of youthful offenders convicted of indictable offences. In these institutions such offences are brought to bear as will, while they are yet at an impressionable age, divert them from lives of crime and by education and training fit them for the duties of citizenship. The law affecting Borstal institutions is further amended by the Criminal Justice Administration Act, 1914, and the Criminal Justice Act of 1925, and it is now possible for a police court to send a youthful offender convicted of certain offences to assizes or quarter sessions in order that sentence of detention in Borstal institutions may be passed upon him. *See* CRIMINALITY; FELONY; MISDEMEANOUR; TREASON. — BIBLIOGRAPHY: C. S. Kenny, *Outlines of Criminal Law*; *Cases Illustrative of Criminal Law*; Sir J. F. Stephen, *A History of the Criminal Law of England*; A. M. Wilshere, *Elements of Criminal Law and Procedure*; Sir Herbert Stephen and Sir Harry Stephen, *Digest of the Criminal Law*.

CRIMINOLOGY. *See* PSYCHOLOGY, ABNORMAL.

CRIMP. An agent who for a commission supplies ships with seamen just before sailing, the term being applied especially to low characters who decoy sailors by treating them, advancing money to them, and giving them goods on credit, till they have them in their power, frequently getting them shipped off in a drunken state after all their money is spent. They also keep an outlook for emigrants, and take them to low lodging-houses in which they themselves are interested.

CRIN'AN CANAL. A canal in Argyllshire, Scotland, cutting off the peninsula of Kintyre from the mainland, and greatly shortening the route from Glasgow to Oban and other parts of the west coast; 9 miles long, 12 feet deep, admitting vessels of 200 tons.

CRINOI'DEA (Gr. *krinon*, a lily). The encrinites or sea-lilies, a class of Echinodermata, consisting of animals attached during the whole or a portion of their lives to the bottom of the deep sea by means of a calcareous jointed stem, from the top of which radiate feather-like flexible appendages or arms, in the centre of which is the mouth. Though comparatively few in number now, they lived in immense numbers in former ages, many carboniferous limestones being almost entirely made up of their calcareous columns and joints. The class also includes the widely distributed feather-stars, stalkless forms living at various depths. The rosy feather-star (*Antedon rosacea*) is not uncommon in British seas.

CRIN'OLINE (Fr. from Lat. *crinis*, hair). Properly a kind of fabric made

Woman wearing Crinoline

chiefly of horse-hair, but afterwards generally applied to a kind of petticoat supported by steel hoops, and intended to distend or give a certain set to the skirt of a lady's dress. Hooped skirts (farthingales or fardingales), supported by whalebone, were worn in the time of Queen Elizabeth and James I., and the fashion was again introduced in the time of George II. The crinoline proper came in about 1856, and was worn by women of all ranks, sometimes proving by its portentous dimensions a source of much inconvenience and no little danger. The immense bell-shaped crinolines happily fell into disuse about 1866.

The manufacture of crinoline wire was for years a leading branch of the steel trade, and its annual production was valued at £400,000. A horse-hair and cotton fabric used as a material for making ladies' bonnets is also called crinoline.

CRI'NUM. A genus of handsome plants of the ord. Amaryllidaceæ, with strap-shaped leaves and a solid scape bearing an umbel of many rosy, fragrant flowers. There are numerous species found in Asia, Australia, South America, and certain

Crinum asiaticum

parts of Africa, and interesting hybrids have been produced by Europeans gardeners. The *Crinum asiaticum* has a bulb above ground, which is a powerful emetic, and is used by the natives to produce vomiting after poison has been taken.

CRIO-SPHINX (Gr. *krios*, a ram). A sphinx with the head of a ram, as distinguished from the *andro-sphinx* or human-headed sphinx, and the *hieraco-sphinx* with the head of a hawk.

CRIPPLE CREEK. A town of the United States, Colorado, in the Rocky Mountains, in the group to which Pike's Peak belongs, at the height of 9500 feet, an important gold-mining centre. Pop. 6206.

CRI'SIS (from the Gr. *krinein*, to decide). In medicine, the turning-point in a disease at which a decided change for the better or the worse takes place. In regular fevers the crisis takes place on regular days, which are called *critical days* (the 7th, 14th, and 21st); sometimes, however, a little sooner or later, according to the climate and the constitution of the patient. The word *crisis* is also figuratively used for a decisive point in any important affair or business, for instance, in politics and commerce. Commercial crises have been in an especial degree the subjects of study at the hands of economists, with the result of establishing a curious periodicity in their recurrence. The commercial cycle apparently completes itself in about ten years, the earlier portion of the period being attended with improving trade, a steady rise in prices, wages, and profits, and a considerable inflation of credit. Excitement, overtrading, and unwise speculation result in serious failures, and there follows a period of distrust and distress, in which industry is more or less disorganized.

CRISPI, Francesco. Italian statesman, born at Ribéra, Sicily, 4th Oct., 1819, died at Naples, 12th Aug., 1901. He studied law at Palermo, where he was called to the Bar in 1846. In 1848 he took an active part in the Sicilian revolution, and after its disastrous issue retired to Piedmont, where he engaged in journalism. Compelled to flee to France in 1853 and thence to England, he returned in 1860 and helped Garibaldi in the latter's expedition for the liberation of the two Sicilies. After the Italian union of 1861 he entered Parliament as representative of Palermo, and immediately made himself prominent as the leader of the Radical Left. Elected President of the Chamber in 1876, he soon afterwards joined the Depretis ministry, but was driven from office in consequence of a charge of bigamy, subsequently disproved.

In 1887 he succeeded Depretis as Premier, and proved a strong advocate of the Triple Alliance between Italy, Germany, and Austria. Although violently attacked, he remained in office until 1891, and again from 1893 till 1896, when, after the defeat of the Italians at Adowa, he was compelled to resign. A great statesman, Crispi was often misunderstood, the Conservatives accusing him of being a Republican, whilst the Republicans were hostile to him for lending his support to monarchy.—Cf. W. J. Stillman, *Francesco Crispi: Insurgent, Exile, Revolutionist, and Statesman.*

CRISPIN and his brother CRISPINIAN. Two Roman saints who died as martyrs in Gaul (at Soissons) in 285 or 286. St. Crispin worked at the trade of shoemaking, and hence is the patron of shoemakers. Their feast falls on 25th Oct.

CRISTOBAL. A seaport, Panama, at the Atlantic end of the canal. It has a large transport trade, and has every facility for repairing and fuelling ships.

CRISTOBALITE. A form of silica crystallizing in the cubic system. It was first found in Mexico, together with tridymite. On slow artificial heating, quartz passes at 1470° or so into cristobalite, and this melts at or near 1710°.

CRITICISM, Literary. Criticism (Gr. *kritikos*, from *krinein*, to judge) is, as its etymology indicates, judgment, adverse or favourable, passed on human achievements, inventions, and institutions. By literary criticism we mean that branch of literature which deals with the analysis, interpretation, or valuation of literature as a whole, judging its merits and defects. It is the art of estimating the qualities of literary work. It may be defined as the effort of the mind to see things as they are, and to appraise literature at its true worth without prejudice. Literary criticism is, therefore, the impartial judgment of literary art. But whilst literary criticism is a branch of literature, it is not a *genre* in itself. It is unlike and has no analogy with either poetry, novel, or drama. It is the judge and the æsthetic conscience of literature, and stands to it in the same relation as literature itself stands to life. It is at once a philosophy and a history of taste.

Literature has been rightly defined as "an interpretation of life under various forms of literary art," and criticism is the judgment and analysis of that interpretation. Just as literature interprets life and nature, and enables the reader to understand and appreciate their beauty, criticism helps him to understand and appreciate the beauty of literary art. It is, therefore, erroneous to conceive criticism as merely destructive. Its principal function is not to express a hostile opinion, to censure and to depreciate, to cavil and to blame, but to interpret, to analyse, and to judge honestly and impartially.

Walter Pater preferred to speak of "literary appreciations" rather than criticism. The literary critic is not, as Disraeli once remarked, "a man who has himself failed in literature," but the guide, philosopher, and friend of the reader and of the student. The aim of the literary critic is, or should be, to quote Matthew Arnold, "a disinterested endeavour to learn and to propagate the best that is known and thought in the world." By propagating this best, both from the ethical and æsthetic points of view, by interpreting the work of a great author who draws his inspiration directly from life, literary criticism, too, deals to a certain extent, with life itself. It is, therefore, constructive and creative in its own way. The essentials of all literary criticism being impartiality of judgment, a sense of beauty, and a power of intuition, it logically follows that it is not a narrow system of rules and formulæ, but a broad outlook upon life and human achievements. It may oppose anarchy, but true literary criticism would lose its value if it were to disregard liberty and restrict genius. Literary criticism should endeavour to register what has been, but it has no right to dictate what ought to be, because ever and anon genius brushes aside the authority of the critic.

Taste can never be absent from literary criticism. Its function is to interpret the sense and meaning of literature, to enlighten and to stimulate, to teach the student how to read for himself, and enable him to perceive those beauties which he would otherwise have missed. The layman admires, but he knows not why; the critic tells him the reason why. He interprets the beauty which pleases the multitude in the light of an analysis. By analysing and interpreting, by giving a perception of the ideal aspect of literary art, literary criticism also prepares the reader to appreciate the æsthetic qualities of future work. It makes intelligible the sense of the beautiful, which is latent in almost every one. By penetrating the heart of a work by a great author, or even a lesser author, by analysing its meaning, and distinguishing between what is permanent and temporary in it, by elucidating its ethical and æsthetic principles, the literary critic helps the reader not only to understand the book, and to appreciate its merits and defects from the critic's point of view, but also to judge for himself. "To feel the virtue of the poet or the painter," wrote Walter Pater, "to disengage it, to set it forth—these are the three stages of the critic's duty."

Literary criticism may be either general, when it deals with the principles of literary composition, with the questions of taste and style, or individual, if it discusses the merits and defects of a work or the works of certain authors. It is, however, difficult to separate, and draw a line between general and individual literary criticism. On the one hand, the general principles of literary

æsthetics could hardly be discussed without being illustrated by examples, whilst in passing judgment on the work of an author the critic must necessarily refer to those principles of literary æsthetics which dictate his verdict.

In the history of criticism various theories and definitions, and consequently various methods, have been adopted, but it does not enter within the scope of this article to enumerate them all. Suffice it to mention only two varieties, the judicial and the inductive criticism. The first passes judgment on literary work; it evaluates it or appraises it, whilst the second merely collects and arranges the facts, examines and describes the work methodically.

History of Literary Criticism.—Literary criticism is as old as literature itself. Side by side with the genius which creates there is also the spirit which reasons in its admiration, reflects and expresses an opinion. Among the Greeks criticism existed in practice long before it had even a name, but the true founder of Greek literary criticism was Aristotle. In his work *The Poetics* he laid down the rules of literary criticism, rules which still have their value even in modern times. According to Aristotle, the function of art and of literature is a pleasure-giving representation or an imitation of what is universal. Great art and literature are those which give lasting pleasure to society and not to the individual, works which stand the test of time.

Other important Greek critics were Theophrastus, Aristoxenus, Aristarchus, Zoilus, the critic of Homer; the critics of the Alexandrian school, Dionysius of Halicarnassus, Plutarch, Lucian, and especially Longinus, who left a work entitled *On the Sublime*.

Rome followed in the traces of Greece, and Greek influence upon Roman literature was paramount. Among Latin critics may be mentioned Cicero (*De Oratore*); Horace, who set forth the canons of poetic art in a pleasant and polished manner in his *Ars Poetica*; and especially Fabius Quintilianus (A.D. 118), whose *Institutiones Oratoriæ* is by far the most important Roman contribution to literary criticism. There was little criticism during the Middle Ages. There were poets, artists, and philosophers, but no critics. The entire literature of the Middle Ages was, as Brunetière has pointed out, "impersonal, anonymous, universal." Mediæval man was not master of either his deeds or his thoughts, and to criticize was a freedom which he had not yet acquired.

"The Middle Ages, whatever they were or were not," wrote Professor Saintsbury, "were certainly not ages of criticism. Their very essence was opposed to criticism." The first great literary critic who arose towards the end of the Dark Ages was Dante. In his work *De Vulgari Eloquio* he treated of the vulgar tongue which we acquire without any rule, and which he considers nobler because more natural. In the meantime the Italian Renaissance began to shed its light upon mediæval Europe.

The Italian Renaissance established the æsthetic foundations of the vast literature which the Revival of Learning had discovered, and restored the element of beauty to its rightful place. The entire literary criticism of the Italian Renaissance is influenced by Aristotelianism (Aristotle's *Poetics*), by humanism, classicism, or the imitation of the classics, and by rationalism, or the authority of reason. The Italian Renaissance produced such literary critics as Vida (*Poetics*, 1527), Scaliger (*Poetices*, 1561), Castelvetro (*Poetica*, 1570), Tasso (*Discorsi*, 1587), and others. From Italy of the Renaissance the classical traditions were passed on to France, England, and the rest of Europe. In France literary criticism began with Du Bellay, Ronsard, and the other members of the Pleiade. It was inaugurated with the translation of Horace's *Ars Poetica* into the vernacular. Joachim du Bellay wrote his *Défense et Illustration de la Langue Française* (1549), and Vauquelin de la Fresnaye published his *Art Poétique* (1605).

French literary critics of this period were still under the influence of Italy. Their purpose was to defend the French language and to prove the degree of perfection which it is capable of attaining. What Dante did for Italy in his *De Vulgari Eloquio*, Du Bellay did for France, and the Italian poet's work served the Frenchman as model. Literary criticism in England during the sixteenth and seventeenth centuries began with Coxe's *Arte or Crafte of Rhetoryke* (1524), but the first critic of importance was Thomas Wilson (*Arte of Rhetoryke*, 1553). He was followed by Roger Ascham (*The schoolmaster*, 1563-68). G. Gascoigne wrote his *Notes of Instruction concerning the making of Poesie*, and Gosson wrote his famous *Schoole of Abuse* (1579), wherein he poured out abuse against the stage, and called his own time a day "when Englishmen seemed to have robbed Greece of gluttony, Italy of wantonness, Spain of pride, France of deceit,

and Dutchland of quaffing." He affirmed with Plato that art contained within itself its own disintegration. Gosson's attacks called forth the reply of Sir Philip Sidney (*The Defence of Poesy*). This famous work is a summary of the literary criticism of the Italian Renaissance, and the author invokes the authority of Aristotle in his definition of poetry. Mention must also be made of George Puttenham (*Arte of English Poesie*, 1589), and especially of Ben Jonson, whose doctrines and ideas about poetry are derived from Aristotle through the medium of Heinsius. By the end of the sixteenth century the authority in literary criticism had passed from Italy to France, and for two centuries Malherbe determined the course of French poetry.

Among the prominent French literary critics of modern times may be mentioned Corneille, Boileau, Voltaire, Diderot, and Sainte-Beuve. Mme de Stäel and others formulated the idea that literature is an "expression of society," Sainte-Beuve that it is an "expression of personality," whilst Taine maintained that literature is an "expression of race, age, and environment."

In the first half of the seventeenth century England was occupied with civil and religious wars, and there was little time for questions of literature and literary criticism. Then Dryden, the greatest English man of letters of his day, came, and, calling attention to the new developments of literature, pleaded for the rights of personal judgment. From being moral with Addison, literary criticism was general with Dr. Johnson, who became the literary autocrat of his country. In the meantime the battle of the ancients and the moderns, of the classicists and romanticists, was being fought both in England and in France. New influences were astir, the worship of the classics was on the wane, the old gods had to make room for new ones. Both in England and in France, where literature was in the bondage of classical tradition, people at last saw that in reality there was no literary criterion of antiquity which could once for all constitute a set of rigid types. But both in England and in France no criterion of literary production could be set up; in its stead individual methods came into vogue. The dawn of the Romantic movement first rose in England, where the revolt was led by Wordsworth. Among the most noteworthy modern English literary critics are Matthew Arnold, Walter Pater, Macaulay, Swinburne, Leslie Stephen, and the historian of literary criticism, George Saintsbury.

We have spoken of literary criticism in France and in England, but mention must also be made of the numerous critics of America, among whom Edgar Allan Poe and Emerson are the most noteworthy, and of Russia where Dobrolyubov, Bielinsky, Pissarev, Tolstoy, and others promulgated their theories on art and literature.

In Germany literary criticism has been first and foremost history of literature. Germany is the country where one argues most, although it is not the country where one produces least. The literary critics of Germany promulgated the reforms and innovations in poetry and drama, formed schools, and reigned supreme. The works of the leaders were, and still are, so many manifestoes and programmes wherein the law is laid down. The most noteworthy critics of Germany were Goddsched and Bodmer, Schiller and Goethe, Winkelmann and Lessing, the two Schlegels, Creuzer, Humboldt, Wolf, Nietzsche, and others.

Modern literature has opened wide paths to criticism. Whilst the Greeks and Romans had only their own literatures to study, the moderns have the novels, epics, and dramas of many nations and ages to study and to compare. This study of comparative literature enables the modern literary critic to build up standards of criticism. The growth of new methods of thought, the revolutions wrought in all departments of mental activity, and above all the acquaintance with foreign literature, have not only given a new stimulus to the critical spirit, but enable the modern literary critic to discover those principles by which our judgments of literature are to be directed and controlled.—BIBLIOGRAPHY: M. Arnold, *Essays in Criticism*; W. Hudson, *Introduction to the Study of Literature*; C. M. Gayley and F. N. Scott, *Introduction to the Methods and Materials of Literary Criticism*; C. W. Moulton, *The Library of Literary Criticism of England and America*; G. E. B. Saintsbury, *History of Criticism and Literary Taste in Europe*; J. E. Spingarn, *History of Literary Criticism in the Renaissance*; W. B. Worsfold, *Principles of Criticism*.

CROATIA-SLAVONIA. A province of Yugoslavia (the Serb, Croat, and Slovene kingdom), formerly part of Hungary. It is partly bounded by the Adriatic, Dalmatia, and Bosnia. The Drava and the Sava form part of the frontier. The

surface is irregular, the Alps extending into it, and culminating at the height of 4400 feet. The country is in the south unfertile, in many parts, indeed, being almost sterile. Barley and oats are grown, but the country is pastoral rather than arable. In some parts the vine is cultivated, also the olive, mulberry, and fig.

The inhabitants are principally Slavs (Croats and Serbs). Three-fourths of the population are Roman Catholics, while the rest are mainly Greek Christians. The area is 16,418 sq. miles, and the pop. 2,739,593. Under the Empire, Croatia-Slavonia was undeveloped, but since 1918 it has made great progress. The chief towns are Zagreb, Osijek, Zemun, and Karlovac.

History.—In A.D. 640 the Croats, a tribe from the Carpathians, settled in Croatia, and gave their name to the country. For a time it maintained an independent existence, but since 1091 it generally belonged to Hungary. Until 1840 the Croats acquiesced in their position, but when the Magyars endeavoured to introduce Hungarian as the official language, a Nationalist party was formed with a view to opposing Hungarian influence. The Nationalists promoted the union of all Illyrian Slavs, i.e. Serbs, Croats, and Slovenes, hence the name of the Illyrist party. They endeavoured to secure the formation of a separate kingdom, comprising Dalmatia, Croatia-Slavonia, and the islands of the Quarnero. The agitation for a Great-Croatia was again revived in 1878, when Austria occupied Bosnia and Hercegovina, and especially since 1905. Constitutional government was suspended in the country in 1912, but again restored in 1913. On 30th Oct., 1918, the Croatian Assembly proclaimed the complete independence of Croatia, Slavonia, and Dalmatia, and a National Council representing all the Yugo-Slav lands was established. The opposition of the Croats, under Stefan Raditch, to the centralist Government culminated in the assassination of Raditch, the abolition of the National Assembly by Alexander, King of Yugo-Slavia (Jan. 1929), and the union of the country under a royal dictatorship. *See* YUGOSLAVIA.

CROCE, Benedetto. Italian philosopher and critic, born at Pescasseroli, in Avezzano, 1866, and educated at Naples and Rome. The cardinal point of Croce's philosophy is a distinction between logic and intuition, the former dealing with the apprehension of universals, the latter with the apprehension of the particular, the individual. The act of intuition is the act of expression, and creative art is, therefore, according to Croce, intuitive, as it is the act of expression in the mind of the artist. Croce also excludes the idea of "beauty," as it is commonly understood, from æsthetics. He edited the journal *La Critica* from 1902, and the series of *I Scrittori d'Italia*, 1911, continued by Nicolini. His works include: *Filosofia della spirito*, in three parts; *Estetica*, *Logica*, and *Etica*, all translated into English; *Æsthetic, as Science of Expression and General Linguistic*; *What is Living and what is Dead of the Philosophy of Hegel*; *The Philosophy of Giambattista Vico*; *Historical Materialism and the Economics of Karl Marx*. He was made an honorary Senator in 1909.

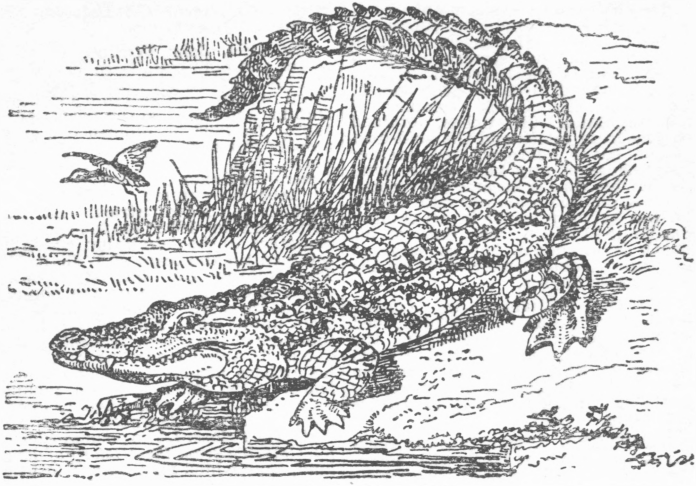
CROCID'OLITE. A blue fibrous amphibole occurring in Griqualand West, commonly seen in its brown and yellow form, where the original mineral has been almost entirely replaced by quartz and iron hydroxid. When polished it forms an ornamental stone with a silky lustre, and has been styled *tiger's eye*.

CROCIN. A colouring-matter obtained from the fruit of *Gardenia grandiflōra*, Chinese yellow pods, largely used in China for dyeing silk, wool, and other fabrics yellow.

CROCKET. In Gothic architecture, an ornament, usually in imitation of curved and bent foliage, but sometimes of animals, placed on the angles of the sides of pinnacles, canopies, and gables.

CROCKETT, Samuel Rutherford. Scottish novelist, born in 1859, near New Galloway, died 1914. Educated at Castle-Douglas and at Edinburgh University, he became Free Church minister at Penicuik, but gave up the Church for literature. *The Stickit Minister*, which appeared in 1893, first made his name known. Since then he gave to the public a number of tales and sketches, including: *The Raiders*, *Mad Sir Ughtred of the Hills*, *The Lilac Sunbonnet*, *The Men of the Moss Hags*, *The Playactress*, *Sweetheart Travellers*, *Cleg Kelly*, *Joan of the Sword Hand*, *Maid Margaret*, and *Red Cap Tales*.

CROC'ODILE. A genus, family, and order of saurian reptiles, comprising the largest living members of the class. The characteristics of the ord. Crocodilia are as follows:—The skin is covered with square bony plates; the tail is long and compressed laterally. The four feet are short, and there are five toes on



Crocodile (*Crocodilus vulgaris*)

each of the two fore-feet, and four on each of the two hind-feet, the latter more or less webbed; the limbs are feeble. The jaws are long and their gape of enormous width. The nostrils are at the extremity of the snout, and capable of being closed to prevent ingress of water. The heart is four-chambered. The most ancient forms of the group were Pelagosaurus from the Upper Lias rocks, Steneosaurus ranging from them to the Kimmeridge clay, and Teleosaurus, from the Lower Oolites. The families now existing are the Alligatoridæ, Crocodilidæ, and Gavialidæ. The alligators are all New World forms. The gavial proper (*Gavialis gangeticus*) is confined to the East Indies. The Crocodilidæ, to which family the crocodile belongs, have unequal teeth and no abdominal plates, and the cervical and dorsal plates are distinct for the most part. The crocodile of the Nile (*Crocodilus vulgāris*) is the best-known member of the order; another species (*C. palustris*) is met with in South Asia, Sunda, and the Moluccas.

The crocodile is formidable from its great size and strength, but on shore its shortness of limb, great length of body, and difficulty of turning enable men and animals readily to escape pursuit. In the water it is active and formidable. It is exclusively carnivorous, and always prefers its food in a state of putrefaction. In Egypt it is no longer found except in the upper or more southern parts, where the heat is greatest and the population least numerous. Crocodiles are still common enough in the River Senegal, the Congo, and the Niger. They grow sometimes to a length of 30 feet, and apparently live to a vast age.

CROCOITE, or **Crocoi'site.** A mineral, a native form of lead chromate, of a brilliant orange-red colour. In it chromium was first discovered in 1797.

CROCUS (Gr. *krokos*, saffron). A genus of plants of the ord. Iridaceæ, forming one of the most common ornaments of the garden. Most of the species are natives of the south of Europe and the Levant; and three grow wild or naturalized in Britain. They may be divided, according to their period of flowering, into *vernal* and *autumnal*. Among the vernal crocuses may be mentioned the white and purple *C. vernus*; *C. versicŏlor*, distinguished by the yellow tube of its flower bearded with hairs, and its sweet scent; *C. biflōrus*, the Scotch crocus, with beautiful pencilled sepals, and clear or bluish-white petals. Among the autumnal species are *C. nudiflōrus* and *C. sativus*, whose long, reddish-orange, drooping stigmas, when dried, form *saffron*. Saffron was formerly largely grown at Saffron Walden. The cultivation of crocus is now an important industry in Holland.

CRŒSUS. The last King of Lydia, son of Alyattes, whom he succeeded in 560 B.C., extending the empire from the northern and western coasts of Asia Minor to the Halys on the east and Mount Taurus on the south, including the Greek colonies of the mainland. His riches, obtained chiefly from mines and the gold-dust of the River Pactolus, were greater than those of any king before him, so that his wealth became proverbial. Having entered upon war with Cyrus, he was taken prisoner in his capital, Sardis (546 B.C.). The date of his death is unknown, but he survived his captor, and is referred to in the reign of Cambyses.

CROFT, William. An English musical composer, born in 1678, died 1727. He was organist in the Chapel Royal, and published *Musica Sacra*, or *Select Anthems*. He also edited a collection of the words of anthems under the title of *Divine Harmony*.

CROFTERS. Petty farmers renting a few acres of land, with sometimes the right of grazing their cattle in common on a piece of rough pasture. Crofters are numerous in the Highlands and in the Western Islands of Scotland, as well as in some other localities. From many districts they have been removed owing to their holdings being absorbed in sheep farms or deer forests, and they are now mainly congregated on the seashore, where they may partly maintain themselves by fishing. From the depression in agriculture and other causes the condition of the crofters has become very precarious, and efforts have been made by philanthropists as well as by the legislature to relieve them. The Crofters' Act, passed in 1886, upon an inquiry conducted by the Napier Commission, after the agrarian disturbances in Skye and Lewis in 1883 and 1884, provides for security of tenure, the fixing of a reasonable rent, compensation for improvements and enlargement of buildings. A crofter is defined by it as a yearly tenant, at a rent not above £30, of a holding situated in a "crofting parish." Commissioners appointed under this and subsequent Acts, such as the two small Acts passed in 1888 and 1891, the Congested Districts (Scotland) Act, 1897, have for many years been going over the various crofting districts, and have granted great reductions of rent besides cancelling large proportions of arrears. On 1st April, 1912, the Congested Districts Board ceased to have a separate existence, and became merged in the Board of Agriculture for Scotland which then came into being.—Cf. Dalriad, *The Crofter in History*.

CROKER, John Wilson. English writer and politician, born at Galway in 1780, died in 1857. He was educated in Cork, and at Trinity College, Dublin, and called to the Irish Bar in 1802. In 1803 he published anonymously *Familiar Epistles on the Irish Stage*, and in 1805 an *Intercepted Letter from Canton*, both clever satires. In 1808 he entered Parliament as member for Downpatrick. He was appointed in 1809 to the post of Secretary to the Admiralty, which he retained till the reign of William IV. The Reform Bill was strenuously opposed by him, and on the passing of that measure in 1832 he withdrew from public life. He was one of the founders of the *Quarterly Review*, and one of its ablest contributors, though his articles display frequent malevolence. His other writings include an edition of Boswell's *Life of Johnson*; *Songs of Trafalgar*, and *The Battles of Talavera*, two poems; *Stories for Children from the History of England*, from which Sir Walter Scott derived his idea of *Tales of a Grandfather*; and editions of the *Suffolk Papers*, *Lady Hervey's Letters*, *Lord Hervey's Memoirs*, and *Walpole Letters*.—Cf. L. J. Jennings, *The Croker Papers*.

CROKER, Thomas Crofton. Collector of folk-lore, born at Cork in 1798, died in 1854. While in a merchant's office in Cork he commenced the collection of the songs and legends current among the peasantry of the south of Ireland. In 1819 an appointment in the Admiralty was obtained for him, and he retired with a pension in 1850. His best-known work is his *Fairy Legends and Traditions of the South of Ireland* (1825).

CROLL, James. Scottish geologist, born 1821, died 1890; he was apprenticed to a millwright, and afterwards was an insurance agent; was keeper of the museum in the Andersonian University, Glasgow; and from 1867 to 1881 was connected with the Geological Survey of Scotland. He wrote *The Philosophy of Theism*; *Climate and Time in their Geological Relations*, his most important work; *Discussions on Climate and Cosmology*; *Stellar Evolution*; and *The Philosophical Basis of Evolution*.

CROLY, Rev. George, LL.D. Author and preacher, born at Dublin in 1780, died in 1860. He studied at Trinity College, Dublin; was appointed to a small curacy in Ireland, but resigned it and became a prominent figure in London journalism and letters. His separate literary works include:

Paris in 1815, a poem ; *The Angel of the World*, a tale ; *Catiline*, a tragedy ; *Pride shall have a Fall*, comedy (1824); and *Salathiel*, a romance.

CROMAGNON MAN. Primeval European race which entered Europe in the upper palæolithic age. The name was given by Paul Broca to five skeletons discovered in 1868 in the Cromagnon grotto at Les Eyzies, Dordogne. Others were found elsewhere. Tall and long-headed, they introduced the Aurignacian civilization and became part of modern man's direct ancestry.

CROM'ARTY. A seaport and parliamentary burgh of Scotland, at the extremity of the peninsula which separates the Moray from the Cromarty Firth, 16 miles N.E. of Inverness. Fishing is the chief industry. Cromarty is one of the Wick burghs, and is a naval station. It was the birthplace of Hugh Miller. Pop. (1931), 837.

The county of Cromarty consisted of a large number of detached portions scattered over the county of Ross, with which they are now incorporated. The total area was about 220,800 acres. Inverness and Ross and Cromarty now send three members to Parliament.

CROMARTY FIRTH. An inlet of the sea running into the united county of Ross and Cromarty in a south-westerly direction ; length, about 18 miles ; average breadth, 2 to 5 miles. Its entrance, between two wooded headlands called the Sutors of Cromarty, is about a mile wide. The firth affords excellent shelter for shipping. On its shores are the towns of Cromarty, Invergordon, and Dingwall.

CROM'DALE. A village of Scotland, on the east bank of the Spey, Inverness-shire, the scene of the fight of 1st May, 1690, in which a small body of the adherents of James II. was defeated by those of William III. celebrated in the ballad *The Haughs of Cromdale*.

CROME, JOHN. An English artist, son of a Norwich weaver, born in 1769, died in 1821. During the greater part of his life he was a teacher of drawing. In 1805 he founded the Norwich Society of Artists, of which he became president as well as chief contributor to its annual exhibitions. He excelled in depicting the scenery of his native county, and especially in his handling of trees ; and his high place among British landscape painters is now universally acknowledged. His *Oak at Poringland* ; *Mousehold Heath* ; and *Chapel Fields, Norwich*, are in the National Gallery. He is sometimes called " Old Crome," to distinguish him from his son, Bernay Crome, also an artist.

CROMER, Evelyn Baring, First Earl of. Was born 26th Feb., 1841, died 29th Jan., 1917. He was educated at the Royal Military Academy, Woolwich, entered the Royal Artillery in 1858, became captain in 1870, and major in 1876. He was private secretary to the Earl of Northbrook while he was Viceroy of India, 1872-76, and became Commissioner of Public Debt in Egypt, 1877-79. In 1879 he was appointed Controller-General in Egypt, a country with which his name is inseparably connected. He found the country on the verge of bankruptcy, and left it in a highly prosperous condition. It was due to his administration that the Sudan was restored to the rule of Egypt, and he was largely responsible for the success of the Omdurman campaign. He was created baron (1892), viscount (1898), and earl (1901) ; he was a member of the Order of Merit, and had the Grand Cross of the Bath and of St. Michael and St. George. His publications include : *Modern Egypt* (1908), *Paraphrases and Translations from the Greek*, and *Political and Literary Essays*.

CROMER. A small seaport and bathing-place of England, County Norfolk, 2½ miles N. of Norwich. The old town is now submerged, the sea constantly making fresh encroachments. Pop. (1931), 4177.

CROMLECH. A Gaelic word (*ch* guttural). " Crom " means " bent," " crooked," " inclined," or " curved." Archæologists apply " cromlech " to

Cromlech at Plas Newydd, Anglesey

a group of " menhirs " (Bret. *men*, stone, and *hir*, long) enclosing a space which may be circular, elliptical, or even rectangular. Sometimes confused with *Dolmen* (q.v.).

CROMPTON, Samuel. Inventor of the mulejenny, born near Bolton, England, 1753, died in 1827. He early displayed a turn for mechanics, and when only twenty-one years of age invented his machine for spinning

cotton, which was called a *mule*, from its combining the principles of Hargreaves' spinning-jenny and Arkwright's roller-frame, both invented a few years previously.

The mule shared in the odium excited among the Lancashire hand-weavers against these machines, and for a time Crompton was obliged to conceal his invention. He afterwards brought it again into work; but was unable to prevent others from profiting by it at his expense. Various improvements were introduced from time to time on the mule, but the original principle, as devised by Crompton, remained the same.

The sum of £5000, voted to him by Parliament in 1812, was almost all the remuneration which he received for an invention which contributed so essentially to the development of British manufactures.

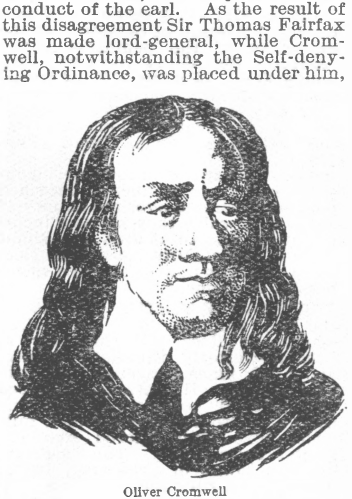
CROMPTON. An urban district of England, Lancashire, included in the parliamentary borough of Oldham, from which it is distant about 3½ miles. Pop. (1931), 14,750.

CROM'WELL, Oliver. Lord-Protector of the Commonwealth of England, Scotland, and Ireland, was born at Huntingdon 25th April, 1599, His father, Robert Cromwell, who represented the borough of Huntingdon in the Parliament of 1593, was a younger son of Sir Henry Cromwell, who was knighted by Queen Elizabeth; and Sir Henry again was a son of Sir Richard Williams, a nephew of Thomas Cromwell, Earl of Essex, whose name he took. Oliver's mother was a daughter of William Steward, of Ely, and could trace her descent back to Alexander, Lord Steward of Scotland, the founder of the House of Stuart.

The first really authentic fact in his biography is his leaving school at Huntingdon and entering Sidney-Sussex College, Cambridge, 23rd April, 1616. On the death of his father in 1617 he returned home, and in 1620 married Elizabeth, daughter of Sir James Bourchier. In 1628 he was member of Parliament for the borough of Huntingdon, to which he returned on the dissolution in 1629. In 1631 he went with his family to a farm which he had taken at St. Ives; and in 1636 to Ely, where he had inherited a property worth nearly £500 a year. During the Short and Long Parliaments he represented Cambridge, his influence gradually increasing.

In the summer of 1642 he was actively engaged in raising and drilling volunteers for the Parliamentary party, in view of the impending struggle with the king. He served as captain and colonel in the earlier part of the war, doing good service with his troop of horse at Edgehill; and it was his energy and ability which made the Eastern Association the most efficient of those formed for mutual defence.

At the battle of Winceby (1643) he led the van, narrowly escaping death, and in the following year he led the victorious left at Marston Moor, deciding the result of the battle. A few months later he was present at the second battle of Newbury, and his action being fettered by the timidity of Manchester, he impeached the conduct of the earl. As the result of this disagreement Sir Thomas Fairfax was made lord-general, while Cromwell, notwithstanding the Self-denying Ordinance, was placed under him,



Oliver Cromwell

with the command of the cavalry and the rank of lieutenant-general.

As the result of the discipline introduced by Cromwell, the decisive victory of Naseby was gained in 1645, and Leicester, Taunton, Bridgewater, Bristol, Devizes, Winchester, and Dartmouth fell into the hands of the Parliament. On the occasion of the surrender of Charles by the Scottish army in 1646, Cromwell was one of the Commissioners, and in the distribution of rewards for services received £2500 a year from the estates of the Marquess of Worcester.

Though at first supporting Parliament in its wish to disband the army, which refused to lay down its arms till the freedom of the nation was established, he afterwards saw reason to decide in favour of the latter course. Hastily suppressing the Welsh rising, he marched against the Scottish royal-

ists, whom he defeated with a much inferior force at Preston (17th Aug., 1648). Then followed the tragedy of of the king's execution, Cromwell's name standing third in order in the death-warrant.

Affairs in Ireland demanding his presence, he was appointed Lord-Lieutenant and commander-in-chief; and by making a terrible example of Drogheda (Sept., 1649), crushed the Royalist party in that country within six months. Resigning the command to Ireton, he undertook, at the request of the Parliament, a similar expedition against Scotland, where Charles II. had been proclaimed king. With an army greatly reduced by sickness, he saved himself from almost inevitable disaster by the splendid victory at Dunbar (3rd Sept., 1650), and a year later put an end to the struggle by his total defeat of the Royalists at Worcester (3rd Sept., 1651). For these services he was rewarded with an estate of £4000 a year, besides other honours.

He already exerted a weighty influence in the supreme direction of affairs, being instrumental in restoring the continental relations of England, which had been almost entirely dissolved, and regulating them so as to promote the interests of commerce. The Navigation Act, from which may be dated the rise of the naval power of England, was framed upon his suggestion, and passed in 1651.

The Rump Parliament, as the remnant of the Long Parliament was called, had become worse than useless, and on 20th April, 1653, Cromwell, with 300 soldiers, dispersed that body. He then summoned a Council of State, consisting mainly of his principal officers, which finally chose a Parliament of persons selected from the three kingdoms, nicknamed *Barebone's Parliament*, or the *Little Parliament*. Fifteen months after a new annual Parliament was chosen; but Cromwell soon prevailed on this body, who were totally incapable of governing, to place the charge of the Commonwealth in his hands. The chief power now devolving again upon the Council of Officers (12th Dec., 1653), they declared Oliver Cromwell sole Governor of the Commonwealth, under the name of *Lord-Protector*, with an assistant council of twenty-one men. The new Protector behaved with dignity and firmness.

Despite the innumerable difficulties which beset him from adverse Parliaments, insurgent Royalists, and mutinous Republicans, the early months of his rule established favourable treaties with Holland, Sweden, Portugal, Denmark, and France. In Sept., 1656, he called a new Parliament, which undertook the revisal of the Constitution and offered Cromwell the title of king. On his refusal he was again installed as Lord-Protector, but with his powers now legally defined. Early in the following year, however, he peremptorily dissolved the House, which had rejected the authority of the second chamber.

Abroad his influence still increased, reaching its full height after the victory of Dunkirk in June, 1658. But his masterly administration was not effected without severe strain, and upon the death of his favourite daughter, Elizabeth Claypole, in the beginning of Aug., 1658, his health began to fail him. Towards the end of the month he was confined to his room from a tertian fever, and on 3rd Sept., 1658, died at Whitehall, in the sixtieth year of his age. He was buried in King Henry VII.'s Chapel, in Westminster Abbey, but after the Restoration his body was taken up and hanged at Tyburn, the head being fixed on a pole at Westminster Abbey, and the rest of the remains buried under the gallows.

Great as a general, Cromwell was still greater as a civil ruler. He lived in a simple and retired way, like a private man, and was abstemious, temperate, indefatigably industrious, and exact in his official duties. He possessed extraordinary penetration and knowledge of human nature; and devised the boldest plans with a quickness equalled only by the decision with which he executed them. No obstacle deterred him; and he was never at a loss for expedients. Cool and reserved, he patiently waited for the favourable moment, and never failed to make use of it. In his religious views he was a tolerant Calvinist. He was about 5 ft. 10 in. in height, his body "well compact and strong"; and his head and face, though wanting in refinement, were impressive in their unmistakable strength.

He had appointed his eldest son, Richard, his successor; but the republican and religious fanaticism of the army and officers, with Fleetwood at their head, compelled Richard to dissolve Parliament; and a few days after he voluntarily abdicated the protectorship, 22nd April, 1659. His brother Henry, who from 1654 had governed Ireland in tranquillity, followed the example of Richard, and died in privacy in England.

At the Restoration Richard went to the Continent until 1680, when he assumed the name of *Clark*, and passed the remainder of his days in tranquil seclusion at Chesthunt, Hert-

fordshire. He died in 1712, at the age of eighty-six.

The last of the family was *Oliver Cromwell*, great-grandson of Henry Cromwell, son of the Protector. He was a London solicitor, and clerk to St. Thomas' Hospital. He succeeded to the estate of Theobalds, which descended to him through the children of Richard Cromwell, and died at Cheshunt Park in 1821, aged seventy-nine. He wrote the *Memoirs of the Protector and his Sons, illustrated by Family Papers*. BIBLIOGRAPHY: T. Carlyle, *Letters and Speeches of Oliver Cromwell*; S. R. Gardiner, *Oliver Cromwell*; Lord Morley, *Oliver Cromwell*; C. H. Firth, *The Last Years of the Protectorate*, and article in *Dictionary of National Biography*; S. H. Church, *Oliver Cromwell: a History*,

CROMWELL, Thomas, Earl of Essex. Son of a blacksmith at Putney, in Surrey, born about the year 1490. In his youth he was employed as clerk to the English factory at Antwerp; in 1510 he went to Rome; and on his return to England became confidential servant of Cardinal Wolsey, about 1525. On his master's disgrace in 1529 Cromwell defended him with great spirit in the House of Commons, of which he was then a member; and effectually opposed the articles of treason brought against Wolsey.

After the Cardinal's death he was taken into the King's service, was knighted and made Privy Councillor, and in 1534 became principal Secretary of State and Master of the Rolls. In 1535 he was appointed Visitor-General of all the monasteries in England, in order to suppress them, his services being rewarded by the post of Lord Keeper of the Privy Seal, and the title of Baron Cromwell of Okeham.

On the abolition of the Pope's supremacy he was created King's Vicar-General, and used all his influence to promote the Reformation. He was made Chief Justice Itinerant of the forests beyond Trent, Knight of the Garter, and finally, in 1539, Lord High Chancellor, and the following year Earl of Essex. He at length fell into disgrace with the king for the part he took in promoting his marriage with Anne of Cleves; and others of his political schemes failing, he was arrested on a charge of treason, and beheaded on Tower Hill, 28th July, 1540. Cf. R. B. Merriman, *Life and Letters of Thomas Cromwell*.

CRONJE (kron'ye), **Piet Arnoldus.** Boer general, born in 1835 in the Transvaal; was engaged in the Majuba Hill affair, and was leader of the Boers that captured the "Jameson raiders" at Krugersdorp; repulsed Metheun's force at Magersfontein, but was surrounded at Paardeberg and had to surrender (27th Feb., 1900) with 4300 men, being afterwards sent a prisoner to St. Helena. He died in 1911.

CRONSTADT (kron'stát; Hung., (*Brassó*), a town in Transylvania, formerly Hungary, now belonging to Rumania. It is the principal seat of the industry and trade of the province, lying in a mountainous but well-wooded and romantic district near its south-east corner. Pop. 56,234.

CRONSTADT, or **KRONSTADT.** A maritime fortress of Russia, about 20 miles W. of Leningrad, in the narrowest part of the Gulf of Finland, opposite to the mouth of the Neva, on a long, narrow, rocky island, forming, both by its position and the strength of its fortifications, the bulwark of the capital, and being also the most important naval station of the country.

It was founded by Peter the Great in 1710, and has spacious regular streets with many handsome houses and churches, very large marine establishments, a naval arsenal, a cannon-foundry, building-yards, and docks. The harbour consists of three separate basins—a merchant haven, capable of containing 1000 ships; a central haven for the repair of ships of war; and the war haven, all of which are defended by strong fortifications. Cronstadt used to be the commercial port of Petrograd, but since the making of a deep channel giving large vessels direct access to the capital (now Leningrad) it has lost its position.

In March, 1921, during the Russian rising against Bolshevist rule, Cronstadt was the headquarters of the insurgents. Pop. 62,000.

CRO'NUS. In ancient Greek mythology, a son of Uranus and Ge (Heaven and Earth), and youngest of the Titans. He received the government of the world after Uranus was deprived of it, and was in turn deposed by Zeus. Cronus was considered by the Romans as identical with their Saturnus. *See* SATURN.

CROOK. An urban district of England, Durham, 5½ miles north-west of Bishop Auckland, with extensive collieries. Pop. (1931), 11,690.

CROOKES, Sir William, O.M. English chemist and physicist, born in 1832, died 4th April, 1919; studied chemistry at the Royal College of Chemistry, London; was for a short time connected with the Radcliffe Observatory, Oxford; was professor

of chemistry at Chester Training College; founded the *Chemical News* in 1859, and since then resided in London as its editor and proprietor. He was elected a fellow of the Royal Society in 1863; D.Sc. of Oxford and Dublin; was knighted in 1897, and next year was president of the British Association.

He made important researches and inventions in connection with molecular physics, radiant matter, and high vacua, and was a great authority on sanitation, while he was also a believer in spiritualism. Among his works are: *Select Methods in Chemical Analysis*, *Handbook of Dyeing and Calico-printing*, *Dyeing and Tissue-printing*, *Researches in Modern Spiritualism*, *Psychic Force and Modern Spiritualism*, *The Wheat Problem*, and *Diamonds*.

CROOKES' TUBE. A glass tube or bulb which is provided with metal electrodes and contains a gas at a pressure of a few millionths of an atmosphere. When the tube is connected to the secondary of an induction coil in action, the electrical discharge is accompanied by a fluorescent glow on the cathode. In one form of this tube, a mica cross is placed in front of the cathode, and its shadow is thrown on the glass. Crookes suggested that the discharge consists of streams of charged particles projected from the surface of the cathode. *See* ELECTRON.

CROQUET (krō'kā). An open-air game played with balls, mallets, hoops, and pegs on a level area, which should be at least 30 yards long by 20 wide. The iron hoops (shaped like the letter U) are fixed with their two ends in the ground, arranged in a somewhat zigzag manner over the ground; they are usually ten in number. The posts or pegs (two in number) are placed at the near and far end of the field respectively, marking the starting and turning points. The game may be played by any number of persons up to eight, either individually, or arranged in couples or in sides.

The object of the players is to drive with the mallets the balls belonging to their own side through the hoops and against the posts in a certain order, and to prevent the balls of their opponents from completing the journey before their own by playing them against those of the enemy, and driving them as far as possible from the hoop or post to be played for, the player or players whose balls first complete the course claiming the victory. — BIBLIOGRAPHY: A. E. Mainwaring, *A.B.C. of Croquet*; A. Lille, *Croquet Up to Date*.

CROSBY HALL. Famous London building. A fine example of Tudor domestic architecture, it stood in Crosby Place, Bishopsgate, where it was build in the fifteenth century by Sir John Crosby. In 1638 it passed to the East India Company, after which it was a meeting house. Restored in 1836, in 1910 it was re-erected at the corner of Cheyne Walk and Danvers Street, Chelsea, where it serves as a hall of residence for women students.

CRO'SIER, or **CROZIER** (Low Lat. *crocea*, crook). The staff borne by some of the higher dignitaries in the Roman Catholic and other Churches, and probably the oldest of the insignia of the episcopal dignity. The original form of the staff resembled a shepherd's crook, but from the middle of the fourteenth century the archbishops began to carry, sometimes in addition to the pastoral crook sometimes instead of it, a crosier terminating in a cross or double cross.

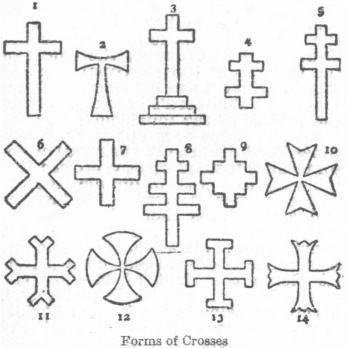
The crosier is carried by bishops and archbishops themselves only in procession and when pronouncing benediction; on all other occasions it is carried before them by a priest. At Rome the right of bearing the crosier is peculiar to the Pope himself, his crosier being in the form of a triple cross. According to present-day usage, however, the Roman pontiff does not use the crosier.

The crosier which is used in the Greek Church originally consisted of a simple staff ending in a large knob. At a later period it terminated in a ball (representing the world) with a cross above and two serpents twined round the upper part of the staff. The staff used in the Armenian Church is headed with a serpent in the form of a crook. The crosier which belonged to William of Wykeham is preserved at New College, Oxford.

CROSS. One straight body laid at any angle across another, or a symbol of similar shape. Among the ancients a piece of wood fastened across a tree or upright post formed a cross, on which were executed criminals of the worst class. It had, therefore, a place analogous to that of the modern gallows as an instrument of infamous punishment until it acquired honour from the crucifixion of Christ. It thus antedates, in both the East and the West, the introduction of Christianity.

The custom of making the sign of the cross in memory of Christ may be traced to the third century. Clement of Alexandria speaks of the cross as *signum Christi* (symbol of the Lord). Constantine had crosses erected in public places, palaces, and

churches, and adopted the cross, according to a legend, as the device for a banner (*labarum*) in consequence of a dream representing it as the symbol of victory. In his time, also, Christians painted it at the entrance of their houses as a sign of their faith, and subsequently the churches were for the most part built in the form of a cross. It did not, however, become an object of adoration until after the alleged discovery of the true cross by the Empress Helena (A.D. 326). Its adoption as the Christian symbol may



Forms of Crosses

1, *Latin Cross*, a cross the transverse beam of which is placed at one-third of the distance from the top of the perpendicular portion, supposed to be the form of cross on which Christ suffered. 2, *Tau Cross* (so called from being formed like the Greek letter τ, *tau*), or cross of St. Anthony, one of the most ancient forms of the cross. 3, *Cross of Calvary*, a cross on three steps. 4, *Cross of Lorraine*. 5, *Patriarchal Cross*. 6, *St. Andrew's Cross*, the form of cross on which St. Andrew, the national saint of Scotland, is said to have suffered. 7, *Greek Cross*, or cross of St. George, the national saint of England, the red cross which appears on British flags. 8, *Papal Cross*. 9, *Cross nowy quadrat*, that is, having a square expansion in the centre. 10, *Maltese Cross*, formed of four arrow-heads meeting at the points; the badge of the knights of Malta. 11, *Cross fourchée* or *forked*. 12, *Cross Patée* or *formée*. 13, *Cross potent* or *Jerusalem Cross*. 14, *Cross fleury*, from the fleurs-de-lis at its ends.

be held to connect itself with the fact that it was used emblematically long before the Christian era, in the same way that traces of a belief in a trinity, in a war in heaven, in a paradise, a flood, a Babel, an immaculate conception, and remission by the shedding of blood, are to be found diffused amongst widely sundered peoples.

The general meaning attached to the sign appears to have been that of life and regeneration. The fact that Jesus suffered death on the cross has converted this figure into a symbol of resurrection and salvation. Since its adoption by Christianity it has undergone many modifications of shape, and has been employed in a variety of ways for ornaments, badges, and heraldic bearings. After the introduction of the cross into the military ensigns of the Crusaders its use in heraldry became frequent, and its form was varied more than that of any other heraldic ordinary, some of the varieties being of great beauty.

The name cross is also given to various architectural structures, of which a cross in stone was a prominent feature; thus we have market crosses, preaching crosses, and monumental crosses. The phrase "to take the cross" meant, for a number of centuries, to devote oneself to fighting the infidels. Hence the orders of knighthood and the crosses of honour, the bestowal of which has, however, now nothing to do with religion.—

BIBLIOGRAPHY: Ansault, *La Croix avant Jésus-Christ*; J. D. Parsons, *The Non-Christian Cross*; W. W. Seymour, *The Cross in Tradition, History, and Art*; Veldeur, *History of the Holy Cross*; Bingham, *Antiquities of the Christian Church*.

CROSS, Exaltation of the. A Catholic festival celebrated on the 14th of September in honour of the recovery of a portion of the true cross from the Persians by Heraclius (A.D. 628) and its erection on Mount Calvary. Lost once more after the Moslem invasion, this cross is expected to reappear finally in the sky at the end of the world.

CROSS, Invention of the (the finding of the cross). A phrase chiefly used in connection with the Catholic festival in honour of the finding of the cross by the Empress Helena (A.D. 326), celebrated on the 3rd of May.

CROSS'BILL (Loxia). A genus of birds of the finch family, deriving their name from a peculiarity of their

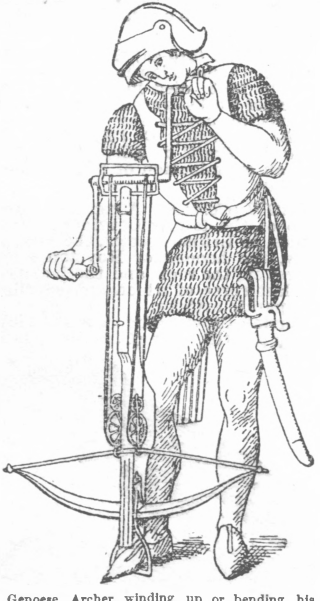
Crossbill

bill, the mandibles of which are curved at the tips, so as to cross each other, sometimes on the one side and sometimes on the other. The form of the bill enables them to extract with ease the seeds of the pine, their usual food, from underneath the scales of the cones. They build and also breed at all seasons of the year, in December, as in March, April, or May.

The common crossbill (*L. curvirostra*) is found in the northern countries of Europe, and is now more common in Britain than formerly. It is from 6 to 6½ inches in length. The male has a red plumage; the female is of a yellowish-green colour. *L. pityopsittăcus*, the parrot crossbill, sometimes visits Britain.

Two species of crossbill inhabit Canada and the northern states, *L. Americana* and *L. leucoptĕra*, the latter rarely found in Britain. They breed in the late winter or early spring.

CROSS-BOW, or ARBALIST. Formerly a very common weapon for shooting, consisting of a bow fastened athwart a stock. The bow, which was often of steel, was usually bent by a lever windlass, or other mechanical contrivance, the missile usually consisting of a square-headed bolt or quarrel, but occasionally of short arrows, stones, and leaden bullets. Though largely used on the European continent, the cross-bow was superseded at an early period in England by the more efficient long-bow, from which twelve arrows could be dispatched per minute to three bolts of the cross-bow.



Genoese Archer winding up or bending his Cross-bow

CROSS-FERTILIZATION. In botany, the fertilization of an egg-cell of one plant by a male gamete derived from another plant of the same species; in flowering plants it must be preceded by cross-pollination (q.v.).

CROSSOPTERYGII. An order of ganoid fossil and recent fishes, so called from the fin-rays of the paired fins being arranged so as to form a fringe (Gr. *krossoi*) round a central lobe. The only living species belong to Polypterus (Nile, and Atlantic rivers of tropical Africa), and Calamichthys (West African rivers from Old Calabar to the Congo), which includes the snake-shaped reed-fishes.

CROSS-POLLINATION. The transference of pollen from the stamens of one flower to the stigma of another flower of the same species. It is most often effected by insects, though a large number of angiosperms (e.g. grasses) and practically all gymnosperms are wind-pollinated. *See* CROSS-FERTILISATION.

CROSS-STAFF. An instrument used by surveyors consisting of a staff carrying a brass circle divided into four equal parts by two lines intersecting each other at right angles. At the extremity of each line perpendicular sights are fixed, the instrument being used in taking offsets.

CROSS-STONE. A name given to the minerals *harmotome*, a hydrated silicate of barium and aluminium, and *staurolite*, a silicate of iron and aluminium, in both of which twin-crystals occur, producing crossing forms. The name cross-stone is sometimes also given to chiastolite.

CROSS-TREES. In ships, certain pieces of timber at the upper ends of the lower and top masts, athwart which they are laid, to sustain the frame of the tops in the one, and extend the top-gallant shrouds on the other.

CROTALARIA. A genus of leguminous plants, all natives of warm climates, but some of them long cultivated in hothouses. *C. juncĕa* is the sunnhemp plant.

CROTALINÆ. The pit-vipers, a sub-family of serpents, including some of the most dangerous, above

all the rattlesnakes. It also includes the copperhead (q.v.).

CROTCH, William. Musical composer, born at Norwich in 1775, died in 1847. As a child he showed astonishing precocity, and when little more than two years old he could play *God Save the King*. At the age of twenty-two he was appointed professor of music at Oxford University, and granted the degree of Doctor of Music. In 1822 he became principal of the Royal Academy of Music. He left a large number of compositions, more especially for the organ, piano, and voice, and three technical treatises.

CRO'TON. A genus of herbaceous plants, shrubs, and trees, ord. Euphorbiaceæ, comprehending a great number of species, many of which possess important medical properties. The more remarkable species are *C. Cascarilla*, a native of the West Indies and Florida, which yields the cascarilla bark, a valuable aromatic tonic; *C. laccifĕrum*, a native of the East Indies, said to furnish the finest of all the sorts of lac; *C. Tiglium*, an inhabitant of the East Indies, from the seeds of which croto n-oil is extracted (*see* CROTON-OIL); and *C. Draco*, a Mexican plant, which yields a red resinous substance used in making varnish. *C. Pseudo-china*, the copalche plant, yields the febrifuge bark of that name, but *C. balsamifĕrum*, *C. aromaticum*, and *C. thurifĕrum* are merely aromatic.

CRO'TON, or **CROTO'NA** (the modern **Cotrone**). In ancient geography, a Greek republic in Magna Græcia or South Italy, famous for its *athletæ*, among whom the chief was Milo. It is still more celebrated as the city where Pythagoras taught between 540 and 530 B.C.

CROTON-OIL. A vegetable oil expressed from the seeds of the *Croton Tiglium*. It is so strongly purgative that one drop is a full dose, and half a drop will sometimes produce a powerful effect, and it should never be used except by the direction of an experienced physician. When applied externally it causes irritation and suppuration, and thus it is used as a counter-irritant in neuralgia.

CROTTLES. A popular name of various species of lichens collected for dyeing purposes, and distinguished as black, brown, white, etc., crottles. Under it are included *Parmelia physŏdes*, *P. caperata*, *P. saxatilis*, *Sticta pulmonaria*, and *Lecanŏra pallescens*.

CROUP. A disease of children which may be of two kinds, *membranous* and *spasmodic*.

Membranous croup is simply diphtheria affecting the larynx, and leading to the formation of the characteristic diphtheritic membrane in that region. It is a severe, and frequently a dangerous illness, and there may be such obstruction in the air-passages that, in order to enable the child to continue breathing, tracheotomy (q.v.) has to be performed. Whether this operation is necessary or not, the patient should always be treated with diphtheria anti-toxin.

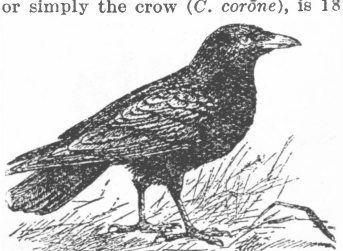
Spasmodic croup is a spasm of the muscles of the larynx, most commonly seen in children between two and five years of age. Frequently the child goes to bed perfectly well, awakes during the night with oppressed breathing and a harsh, rough cough (croupy). These become worse, and in a short time there is evidence of respiratory obstruction, the symptoms of which are rapid and difficult breathing, congestion of the face, cyanosis, and increasing restlessness. The attack passes off gradually, and in many cases the child falls asleep and awakes in the morning in quite normal condition.

Treatment.—During an attack the child should be put in a hot bath and an emetic given; the administration of a small quantity of chloroform may be necessary in the more severe cases. It is of great importance for the welfare of the patient that the difference between the two conditions should be recognized.

CROUSAZ (krö-zä), **Jean Pierre de.** Swiss mathematician and philosopher, born in 1663, died in 1748 or 1750. His chief works are: *Système des Réflexions, ou nouvel Essai de Logique*; *Traité du Beau*; *De l'Éducation des Enfants*; *Traité de l'Esprit Humain*; also an examination of Pope's *Essay on Man*.

CROW (*Corvus*). A genus of birds, type of the family Corvidæ. It includes, as British species, the carrion-crow, the hooded or Royston crow, the raven, the rook, and the jackdaw, the last three of which are described in separate articles.

Carrion-Crow.—The carrion-crow, or simply the crow (*C. corŏne*), is 18



Carrion-Crow

or 19 inches in length, and about 36 inches between the tips of the wings. Its plumage is compact and glossy blue-black with some greenish reflections. Its favourite food is carrion of all kinds; but it also preys upon small quadrupeds, young birds, frogs, and lizards, and is a confirmed robber of the nests of game-birds and poultry. It is not gregarious, being generally met with either solitary or in pairs. It builds a large isolated nest, with from four to six eggs, generally of a bluish-green with blotches of brown. The carrion-crow is easily tamed, and may be taught to articulate words.

American Crow.—The American crow (*C. americānus*) is similar to the foregoing, but is smaller and somewhat gregarious. This crow is common in all parts of the United States, and, as it feeds on corn, is deemed a great nuisance by farmers.

Fish-Crow.—The fish-crow (*C. ossifrăgus*), another American crow, resembling the preceding but smaller, is abundant in the coast districts of the southern states. Its favourite food is fish, but it also eats all kinds of garbage and mollusca. In winter its food is chiefly fruit, and it is then fat and considered good eating.

Hooded Crow.—The hooded, Royston, or grey-backed crow (*C. cornix*) is somewhat larger than the rook. Its head, wings, and tail are black, but less bright than in the rook; the rest of the body is a dull smoke-grey. Its food is similar to that of the carrion-crow, and it builds a similar nest. Indeed, the distinctness of the species *C. corone* and *C. cornix* has been called in question, as they interbreed freely together, and the young of the same nest present more or less resemblance to the one or the other parent. The hooded crow is less common in England than in Scotland and Ireland. All the crows are highly sagacious.

CROWBERRY, or **CRAKEBERRY** (*Empetrum nigrum*). A plant resembling the heaths, but not closely akin to them, and bearing a jet-black berry, common in all the northern parts of Europe and Asia, including the moors of Scotland and the north of England. The berries, which have a slight subacid taste and are sometimes eaten, afford a purple dye. The red crowberry (*E. rubrum*), which has a red fruit, grows in the neighbourhood of the Straits of Magellan.

CROW-BLACKBIRD. The name of certain American birds of the genus Quiscălus, family Icteridæ. The great crow-blackbird (*Q. major*), found in the southern states, Mexico, and the West Indies, is 16 inches long, and of a glossy-black plumage. The female is of a light brown above and whitish beneath. The purple grackle, lesser or common crow-blackbird (*Q. versicŏlor*), is similar in colour to the preceding, but smaller. They reach the middle states of America from the south in flocks in the latter part of March, and build in April in the tall pines or cedars. On their first arrival they feed upon insects, but afterwards commit great ravages upon the young corn. In November they fly southward again.

CROWDS, Psychology of. A crowd is an aggregation or a group of individuals which at a given moment "is filled with a common idea and is conscious of this community of thought." A multitude of individuals, therefore, hurrying in a crowded thoroughfare is not yet a crowd. They only become a crowd at the moment when their attention is attracted by a common object or occurrence, and when a community of thought or of will has been established between the separate individuals. As soon as these individuals are agitated by the same emotions, dominated by a common thought, they become a crowd.

The psychical factors which establish the connection between the various individuals are suggestion, a sentiment of power, and contagion. The separate individuals mesmerize each other, whilst the sentiment of irresponsibility, on account of numbers, gives to the crowd a feeling of power.

Psychologically, the crowd, without being a separate entity or the sum-total of the individuals composing it, has a sort of collective soul. The individuals, having merged their separate individualities into that of the crowd, neither think nor act as they would think or act independently. Indeed, the difference in character between a crowd and the various individuals composing it is very great. Sentiments and passions which would leave the individual cold usually fire a crowd, whilst jokes so inane that they would hardly make an individual smile, call forth roars of laughter from the crowd.

As in a crowd the individual consciousness is concentrated in the common consciousness, this consciousness must be possessed of those qualities which are common to all individuals composing a crowd. Only the most primitive qualities of man are, therefore, reflected in the human crowd, and as far as their mentality is concerned, crowds are very primitive. They are swayed by emotions and feelings rather than by intellect.

As crowds are always in a state of excitement, they are easily suggestible. They can be made to commit atrocious crimes or to die like martyrs, more frequently the former than the latter. Morally, therefore, a crowd may sometimes rise to heroism and frequently descend to the lowest degree of barbarism, because it is swayed by emotions and passions and not by intellect. When speaking of the psychology of crowds, we must also take into consideration race and temperament. An English crowd will differ considerably from Teuton, Latin, or Slav crowds. BIBLIOGRAPHY: A. Christensen, *Politics and Crowd-morality*; G. le Bon, *Psychologie des foules*; G. Mano, *L'âme de la foule*; S. Sighele, *La foule criminelle*.

CROWE, Sir Joseph Archer. Journalist, diplomatist, and writer on art, born 1825, died 1896. He was the son of Eyre Evans Crowe, journalist and historian, and began the study of art as a boy living with his father in Paris. He was also from his early years connected with the newspaper press, and acted as correspondent for the *Illustrated London News* in the Crimea and for *The Times* in the Indian Mutiny. In 1860 he entered on his diplomatic career as Consul-General for Saxony, and long resided at Paris as British commercial attaché for the whole of Europe.

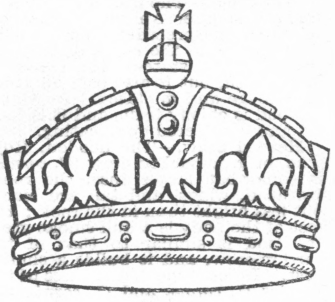
He wrote the following works in collaboration with Signor Cavalcaselle: *Early Flemish Painters*, *History of Painting in Italy*, *History of Painting in North Italy*, *Life of Titian*, *Life of Raphael*. He also published (1895) *Reminiscences of Thirty-five Years of my Life*.

CROW'LAND, or CROYLAND. A town in England, county of Lincoln, 8 miles north of Peterborough. Pop. (rural district), 2704 (1931). It has a curious ancient triangular bridge, where three paths meet, and the remains of an abbey founded in 716, part of which still forms the parish church. Ingulphus was Abbot of Crowland.

CROWN. A circular ornament for the head. As now used the name is limited to the head-dress worn by royal personages as a badge of sovereignty, but it was formerly used to include the wreaths or garlands worn by the ancients upon special occasions. Thus, among the Greeks and Romans, crowns made of grass, flowers, twigs of laurel, oak, olive, or parsley, and afterwards of gold, were made use of as honours in athletic contests, as rewards for military valour, and at feasts and funerals.

It is, however, with the Eastern diadem rather than with the classic corona that the crown as a symbol of royalty is connected; indeed, it was only introduced as such a symbol by Alexander the Great, who followed the Persian usage. Antony wore a crown in Egypt, and the Roman emperors also wore crowns of various forms, from the plain golden fillet to the radiated or rayed crown. In modern States they were also of various forms until heralds devised a regular series to mark the grades of rank from the imperial crown to the baron's coronet.

English Crown.—The English crown has been gradually built up from the plain circlet with four trefoil heads worn by William the Conqueror. This form was elaborated and jewelled, and finally arched in with jewelled bands surmounted by the cross and sceptre. As at present existing the crown of England is a gold circle, adorned with



Crown

pearls and precious stones, having alternately four Maltese crosses and four fleurs-de-lis. From the top of the crosses rise imperial arches, closing under a mound and cross. The whole covers a crimson velvet cap with an ermine border.

Charlemagne Crown.—The crown of Charlemagne, which is preserved in the State treasury of Vienna, is composed of eight plates of gold, four large and four small, connected by hinges. The large plates are studded with precious stones, the front one being surmounted with a cross; the smaller ones, placed alternately with these, are ornamented with enamels representing Solomon, David, Hezekiah, and Isaiah, and Christ seated between two flaming seraphim.

Austrian Crown.—The Austrian crown was a sort of cleft tiara, having in the middle a semicircle of gold supporting a mound and cross; the tiara rests on a circle with pendants like those of a mitre.

French Crown.—The royal crown of France was a circle ornamented with eight fleurs-de-lis, from which rise as many quarter-circles closing under a double fleur-de-lis. The triple crown of the Popes is more commonly called the tiara.

CROWN. A British silver coin value five shillings, first coined by Henry VIII. None were coined from 1861 to 1887. In 1847 and 1848 some pattern crowns were struck with a gold centre, but the experiment was carried no farther.

CROWN, Order of the. Name of several orders of chivalry. In the British Empire there is the Imperial Order of the Crown of India, for women only, established in 1878, and in Italy, the Order of the Crown of Italy, founded in 1868. Other European orders of this name disappeared in 1919.

CROWN AGENTS. Officials appointed by the Colonial Secretary. With headquarters in London, they act as agents for crown colonies and protectorates. Concerned with the commercial and economic interests of the countries they represent, their chief duties are financial, and through them the colonies make purchases.

CROWN COLONY. Land acquired by cession or conquest, and without power of self-government. The British Government is responsible for the legislation of its crown colonies, which are ruled by governors appointed by the king, aided by councils which include members representative of the colony. All enactments must be approved by the Colonial Secretary.

CROWN DEBTS. Debts due to the British Crown, whose claim ranks before that of all other creditors, and may be enforced by a summary process called an extent.

CROWN LANDS. The lands belonging to the British Crown. These are now surrendered to the country at the beginning of every sovereign's reign in return for an allowance (the Civil List) fixed at a certain amount for the reign by Parliament. They are placed under commissioners, and the revenue derived from them becomes part of the consolidated fund. For the year ending March, 1931, the net revenue of the Crown lands amounted to £1,285,198.

CROWN OFFICE. Department of the supreme court of justice in England. Its chief official is called the Master of the Crown Office, and its functions include the issue of indictments, writs of habeas corpus, informations and proceedings for attachment.

CROWN PRINCE. Title borne in monarchical countries by the heir to the throne. His position is comparable to that of the Prince of Wales.

CROWN SOLICITOR, In England, the Solicitor to the Treasury, who instructs counsel in all State prosecutions. In Ireland, an officer attached to each circuit, paid by a salary, whose duty it is to take charge of every case for the Crown in criminal cases.

CROW'S NEST. Pass through the Rocky Mountains of Canada. It is traversed at a height of 5500 feet by the southern branch of the C.P.R. The pass crosses great coalfields whose natural gas is of considerable economic worth.

CROW'S NEST. Small platform with an encircling protection on a ship's mast. It is used as a position for a look-out man in warships and such vessels as whalers. Modern signalling methods have now made the crow's nest unnecessary on many ships.

CROY'DON. A municipal, parliamentary, and county borough, England, in County Surrey, 9¼ miles S. of London, of which it is practically a suburb, near the sources of the Wandle, and near the Banstead Downs. The town, which is a favourite residence of merchants, business men, and retired tradesmen, is surrounded by fine villas, mansions, and pleasure-grounds. It is a place of ancient origin, but from its recent rapid increase is almost entirely new. Of special interest are the remains of the ancient palace, long a residence of the Archbishops of Canterbury.

Croydon was made a municipal borough in 1883, a parliamentary borough with one member in 1885, and with two members in 1918. Pop. (1931), 233,115.

CRO'ZET ISLANDS. A group of four uninhabited islands in the South Indian Ocean, between Kerguelen and Prince Edward Islands. They are all of volcanic origin, and the most easterly of them, East Island, has peaks exceeding 4000 feet. The largest, Possession Island, is about 20 miles long by 10 broad.

CROZIER. *See* CROSIER.

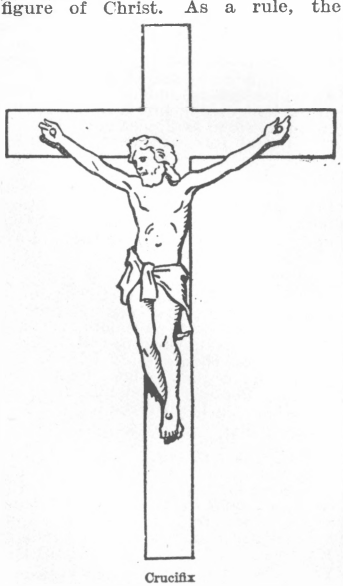
CRU'CIAN CARP. A thick, broad fish, of a deep-yellow colour, the *Cyprīnus carassius*, differing from the common carp in having no barbules at its mouth, inhabiting lakes, ponds, and sluggish rivers in the north of Europe and Asia. The goldfish is a variety of this species.

CRU'CIBLE. A vessel employed to hold substances which are to be submitted to a high temperature. It is usually of a conical, cylindrical, or triangular shape, open at the top, and is made of various materials, such as fire-clay, platinum, a mixture of fire-clay and plumbago, or porcelain.

CRUCIF'ERÆ. A very extensive nat. ord. of dicotyledonous plants, consisting of herbs which all have flowers with six stamens, two of which are short, and four sepals and petals, the spreading limbs of which form a Maltese cross, whence their name. The fruit is a pod with a membranous outgrowth from the two placentæ dividing it into two cells. The mustard, water-cress, turnip, cabbage, scurvy-grass, radish, and horse-radish belong to this family.

They have nearly all a volatile acridity, due to nitrogenous compounds known as *mustard oils*, dispersed through every part, from which they have their peculiar odour and sharp taste, and their stimulant and anti-scorbutic qualities. None are really poisonous. Some are found in our gardens because of their beauty or fragrance, as the wallflower, stock, and candytuft.

CRU'CIFIX (Lat. *crux*, cross, and *figere*, to fasten), a cross bearing the figure of Christ. As a rule, the figures on the most ancient crucifixes were not carved, but were engraved on gold, silver, or iron crosses. At a later period they were painted on wood, and it is only in the ninth century, in the pontificate of Leo III., that the figure of Christ appears carved upon the cross in bas-relief. Originally the body was represented clothed in a tunic reaching to the feet; afterwards the clothing was removed with the exception of a cloth round the loins. Until the eleventh century Christ was represented alive; since that period he has been represented as dead. In the earlier crucifixes, also, the number of nails by which Christ is fixed to the cross is four, one through each hand and each foot, while in the more modern ones one foot is laid above the other and a single nail driven through both. Many crucifixes bear also the superscription in an abbreviated form, and accessory symbols and figures.



Crucifix

CRUCIFIXION. A mode of inflicting capital punishment, by affixing criminals to a wooden cross, formerly widely practised, but now chiefly confined to the Mohammedans. Different kinds of crosses were employed, especially that consisting of two beams at right angles, and the St. Andrew's cross.

CRUDEN, Alexander. Born at Aberdeen in 1701, died in Islington in 1770. He took the degree of M.A. at Marischal College, and in 1722 proceeded to London, where he was employed as tutor. He afterwards opened a bookseller's shop under the Royal Exchange, and in 1735 was appointed bookseller to Queen Caroline. His great work appeared in 1737, under the title of *A Complete Concordance of the Holy Scriptures of the Old and New Testament*. From a pecuniary point of view it was not at first successful, and the embarrassments to which it reduced him unsettled his reason and led to his confinement at Bethnal Green. He was again temporarily confined in 1753. Three editions of the *Concordance* appeared in his lifetime, and he was also the author of *A Scripture Dictionary, or Guide to the Holy Scriptures*; and *The History and Excellency of the Scriptures*.

CRUIKSHANK, George. The greatest of English pictorial satirists after Hogarth, born in London 1792, of Scottish extraction, died in 1878. His father, Isaac Cruikshank, was an engraver of theatrical portraits, prints for cheap books, and caricatures in the manner of Rowlandson and Gillray. From early childhood George Cruikshank was trained to

assist in preparing his father's plates. The earliest of his drawings known is dated 1799, when he was only seven years of age, and when fifteen he was comparatively distinguished.

His first occupation was designing illustrations for children's books and popular songs. He began early also as a political satirist, contributing plates regularly in 1811 to *The Scourge*, in 1814 illustrating Dr. Syntax's *Life of Napoleon*, and doing much work of the kind for Hone, the publisher. His best productions of this period are his drawings of *The Cato Street Conspiracy* and of *The Trial of Queen Caroline*, *The Political Showman*, and *The Political House that Jack Built*.

In 1821 and the succeeding years appeared his illustrations of such popular books as Pierce Egan's *Tom and Jerry*, Maxwell's *History of the Irish Rebellion*, Grimm's *Fairy Tales*, *Peter Schlemihl*, *Baron Munchausen*, Defoe's *History of the Plague*, Scott's *Demonology and Witchcraft*, and *The Ingoldsby Legends*, the artist showing especial excellence in ghostly and fairy subjects. In 1837 he commenced in *Bentley's Miscellany* his famous series of etchings on steel illustrative of Dickens's *Oliver Twist*, followed two years later by those for Ainsworth's *Jack Sheppard*, and then by those for *Windsor Castle* and *The Tower of London*.

Having connected himself with the temperance movement, he produced *The Bottle*, a powerful and popular series of designs, but marking clearly the limits of his art. His temperance connection and his absurd claims to having suggested the idea of Dickens's *Oliver Twist* undermined his artistic reputation. Poorly paid for work by which others profited, he was obliged to part with the vast collection of his works, and in 1866 £50 a year was settled on him from the Royal Academy's Turner Annuities.

He subsequently turned his attention to oil-painting, his most noteworthy pictures being *Tam o' Shanter*, *Disturbing a Congregation*, and *The Worship of Bacchus*, now in the National Gallery. His *Cinderella*, painted in 1854, is in the South Kensington Museum. — BIBLIOGRAPHY: W. B. Jerrold, *Life of George Cruikshank*; W. H. Chesson, *George Cruikshank*.

CRUISER. Warship designed primarily for speed. To-day all cruisers are armoured, and divided into battle cruisers and light cruisers. Battle cruisers are battleships, but with rather lighter armour and greater speed than the battleship proper. Such were the *Lion*, *Tiger*, and the newer *Hood*. Light cruisers are smaller vessels, designed to act as the eyes of the fleet. In the British Navy they are usually named after towns and counties, e.g. *London* and *Norfolk*. The Washington Treaty of 1922 limited the size of cruisers to 10,000 tons and the Naval Treaty of 1930 provided for a limitation of their number and strength. In 1931, excluding battle cruisers, Great Britain had 53 cruisers, Japan 37, the United States 19, and France 16.

CRUIVE (krōv). A trap for fish, especially salmon, consisting of a sort of hedge of stakes on a tidal river or the sea-beach. When the tide flows, the fish swim over the wattles, but are left by the ebb.

CRUSADES. The wars carried on by the Christian nations of the West, fron the end of the eleventh till the latter half of the thirteenth century, for the conquest of Palestine. They were called *Crusades* because the warriors wore the sign of the cross. The Crusades were the result of old antagonism; being a new phase of the conflict between crescent and cross, a conflict which had been carried on for centuries between Islam and the Greek Empire of Constantinople. This antagonism between the Christian and Mohammedan nations had been intensified by the possession of the Holy Land by the Turks and by their treatment of pilgrims to Jerusalem; and the first strenuous appeal was assured of response alike from the pious, the adventurous, and the greedy.

First Crusade.—The immediate cause of the first Crusade was the preaching of Peter of Amiens, or Peter the Hermit, who in 1093 had joined other pilgrims on a journey to Jerusalem. On his return he gave Pope Urban II. a description of the unhappy situation of Christians in the East, and presented a petition for assistance from the Patriarch of Jerusalem. The statements of the Pope at the Councils of Piacenza and Clermont in 1095 produced a profound sensation throughout Europe, and in 1096 several armies set out in different divisions, most of which, being ignorant of military discipline and unprovided with necessaries, were destroyed before reaching Constantinople, which had been chosen for their place of meeting. A well-conducted regular army, however, of 80,000 men was headed by Godfrey of Bouillon; Hugh of Vermandois, brother to Philip, King of France; Baldwin, brother of Godfrey; Robert II. of Flanders; Robert II. of Normandy, brother of

William II., King of England; Raymond of Toulouse; and other leaders. They traversed Germany, Hungary, and the Byzantine Empire, passed over into Asia Minor, conquered Nicæa in June, 1097, and shortly after, on 4th July, fought the first pitched battle at Dorylæum, being completely victorious after a severe contest.

They then marched through Asia Minor upon Antioch, which, with the exception of the citadel, fell into their hands by treachery in June 1098. Surrounded in turn by a

A Crusader armed. Wearing the Sign of the Cross on his surcoat

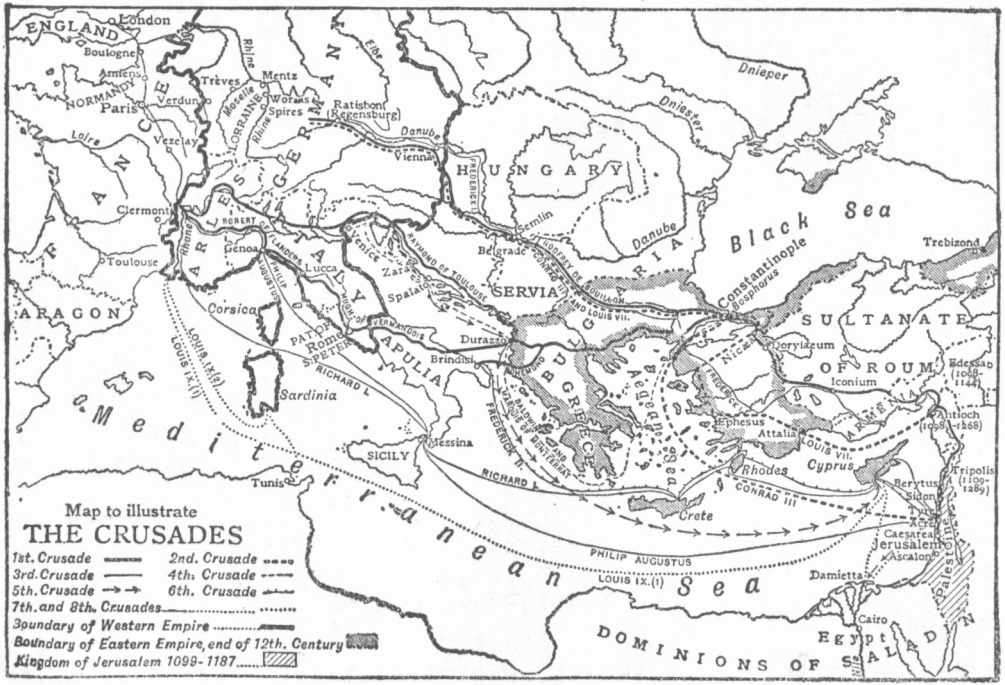
Turkish army, they were soon reduced to pitiable straits, but succeeded in routing their besiegers on 28th June.

After remaining nearly a year in the neighbourhood of Antioch they commenced, in May, 1099, their march against Jerusalem, the siege of which they commenced in June. Their numbers were now reduced to little more than 20,000 men; but after a fierce struggle the town was taken by storm on 15th July, and Godfrey of Bouillon was chosen King of Jerusalem, or, as he preferred to term himself, Protector of the Holy Sepulchre. At his death, in 1100, he was succeeded by his brother Baldwin, who had in the earlier part of the Crusade established himself in Edessa, and made himself ruler of an extensive territory stretching over the Armenian mountains and the plain of Mesopotamia.

Second Crusade.—The second great and regularly conducted Crusade was occasioned by the loss of Edessa, which the Saracens conquered in Dec., 1144. Fearing still graver losses, Pope Eugenius III., seconded by Bernard of Clairvaux, exhorted the German Emperor Conrad III., and the King of France, Louis VII., to defend the cross. Both these monarchs obeyed, and in 1147 led large forces to the East, but returned without accomplishing anything in 1149.

Third Crusade.—The third Crusade was undertaken after the capture of Jerusalem by Saladin in 1187, the monarchs Frederick I. (Barbarossa) of Germany, Philip Augustus of France, and Richard I. (Cœur de Lion) of England, leading their armies in person. Frederick, marching by way of the Danube and crossing from Gallipoli, defeated the Turks at Philomelium (now Finiminum), and penetrated to Seleucia, but was drowned in the Selef. His son Frederick led the small remains to Acre and took part in the siege, but after his death, in 1191, the German army dwindled away. The other monarchs—Richard and Philip Augustus—had in the meantime met at Vezelai in June, 1190, and agreed to unite their forces at Messina in Sicily, where they spent six months at the end of 1190 and beginning of 1191. Philip joined the other Crusaders before Acre on 13th April, 1191; but Richard, whose fleet was separated by a storm, went to Cyprus, and, dispossessing Isaac Comnenus, made himself king. It was not till the 8th of June that he reached Acre, which surrendered a month later. Jealousies, however, arose between the monarchs, and within a few weeks after the fall of Acre the French king returned to Europe.

Richard, now sole leader of the expedition, defeated Saladin and occupied Jaffa or Joppa; but having twice vainly set out with the design of besieging Jerusalem, he concluded (2nd Sept., 1192) a truce of three years and three months with Saladin, who agreed that pilgrims should be free to visit the Holy Sepulchre, and that the whole sea-coast from Tyre to Jaffa (including the important fortress of Acre) should belong to the Crusaders.


Map to illustrate
THE CRUSADES
1st. Crusade
2nd. Crusade
3rd. Crusade
4th. Crusade
5th. Crusade
6th. Crusade
7th. and 8th. Crusades
Boundary of Western Empire
Boundary of Eastern Empire, end of 12th. Century
Kingdom of Jerusalem 1099-1187
ENGLAND
London
Boulogne
Amiens
NORMANDY
Paris
Verdun
Trèves
Mentz
Worms
Spires
Ratisbon (Regensburg)
Vezelay
Loire
Clermont
Toulouse
Rhone
Rhine
Moselle
LORRAINE
Elbe
Danube
Vienna
HUNGARY
Dnieper
Dniester
Black Sea
Trebizond
Semlin
Belgrade
SERVIA
Zara
Spalato
Venice
Genoa
Lucca
Corsica
Rome
PAT. OF S. PETER
APULIA
Durazzo
Brindisi
Sardinia
Messina
SICILY
Tunis
ARAGON
Mediterranean Sea
Constantinople
Bosphorus
Nicaea
Dorylaeum
Iconium
SULTANATE OF ROUM
Edessa (1098-1144)
Antioch (1098-1268)
Tripolis (1109-1289)
Ephesus
Attalia
Rhodes
Cyprus
Crete
Berytus
Sidon
Tyre
Acre
Caesarea
Jerusalem
Ascalon
Damietta
Cairo
Egypt
Palestine
DOMINIONS OF SALADIN
Aegean Sea
BULGARIA
GREECE
ARMENIA
ROBERT OF FLANDERS
PHILIP AUGUSTUS
RICHARD I.
RAYMOND OF TOULOUSE
HUGH OF VERMANDOIS
FREDERICK I.
FREDERICK II.
BALDWIN MARQUIS OF MONTFERRAT
HENRY
GODFREY DE BOUILLON
CONRAD III
LOUIS VII.
LOUIS IX.(1)
LOUIS IX.(2)
LOUIS VII.
PHILIP AUGUSTUS
LOUIS IX.(1)

Fourth Crusade.—The fourth Crusade was set on foot by Pope Innocent III., who commissioned Fulk of Neuilly to preach it in 1198. Among its chief promoters was Godfrey of Villehardouin, seneschal of Champagne; Baldwin, Count of Flanders and Hainaut; Dandolo, the aged doge of Venice; and the Marquis of Montferrat, who was chosen leader. The Crusaders assembled at Venice in the spring of 1202, but were diverted from their original purpose first by the capture of the Dalmatian town of Zara, and then by the expedition which ended in the sack of Constantinople and the establishment of a Latin Empire there (1204).

Fifth Crusade.—The fifth Crusade, undertaken by Andreas of Hungary in 1217, and shared in by John of Brienne, to whom the title of King of Jerusalem was given, had little other result than the temporary occupation of the Nile delta.

Sixth Crusade.—The sixth Crusade, that of Frederick II., Emperor of Germany, was undertaken at the instance of Popes Honorius III. and Gregory IX. On arriving he entered into negotiations with the Sultan of Egypt, and without any fighting recovered for himself, as heir of John of Brienne, the Kingdom of Judea, on the condition of tolerating in his kingdom the Mohammedan worship. He then concluded a useless truce of ten years, got himself crowned at Jerusalem, and returned in 1229.

Seventh Crusade.—The seventh and eighth Crusades were led by St. Louis of France (Louis IX.) in person. This prince was resolved to strike a blow at Mohammedanism in Egypt, He took Damietta in June, 1249. and marched up the Nile, but was compelled to retreat, and finally to surrender with his whole army. He recovered his liberty by the surrender of Damietta, returned to Palestine, and in 1254, on the death of his mother, to France.

Eighth Crusade.—The second expedition of Louis was still more disastrous in its results than the first. He landed his army in 1270 on the northern coast of Africa; but he himself and a large number of his knights died before Tunis, and the majority of the French Crusaders returned home. A crusading army under Prince Edward of England (afterwards Edward I.), originally intended to co-operate with that of Louis, landed at Acre in 1271, but little was effected beyond a new truce for ten years (1272).

For nineteen years longer the Christians in Palestine held with great difficulty the remnants of the Latin kingdom there. But Tyre and Berytus (Beyrout) were successively snatched from them, and finally the capture of Acre by the Sultan of Egypt in 1291 put an end to the kingdom founded by the Crusaders.

Results.—Despite their want of success, however, the Crusades were of considerable indirect value in that by these joint enterprises the European nations became more connected with each other, the class of citizens increased in influence, because the nobility suffered by extravagant contributions to the Crusades, and their expenses led to the sale of estates, town rights, and manorial rights to merchants, burgesses, and others.

The Crusades may also be said to have opened the East to the West, and a more intimate commercial intercourse greatly augmented the wealth of the cities, while a number of arts and sciences till then unknown in Europe, were introduced.

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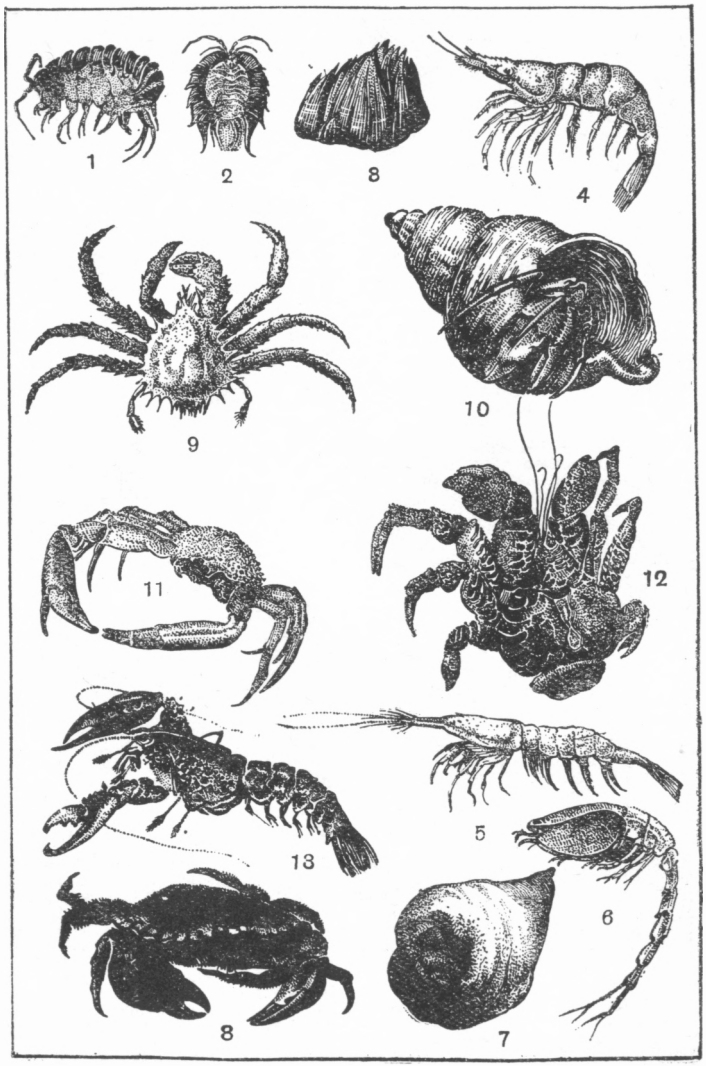
CRUSTA'CEA. One of the classes into which the sub-kingdom of *arthropoda* (jointed-limbed invertebrates) is divided. The body consists of head, thorax, and abdomen, of which the two former are united into a single mass, cephalo-thorax, covered with a shield or carapace, and the abdomen usually presents the appearance of a tail. In some—the sand-hopper, wood-louse, etc.—the head is partially distinct from the thorax.

The Crustacea breathe by branchiæ or gills, or by membranous vesicles, or by the general surface; and the body is composed of a series of rings more or less distinct. They possess the faculty of reproducing lost parts in an eminent degree. The integument is chitinous and remains elastic in some, as the Isopods, throughout life. But in the majority it is calcified or transformed into a hard shell, prisms of carbonate of lime being deposited in the outer layer. It consists of a great number of distinct pieces connected together by portions of the epidermic envelope, just as among the higher animals certain cones are connected together by cartilages. Several species, if not all, moult or cast these outer skeletons or shells in the progress of growth; this is the case with crabs and crayfish.

The general grouping of the



1, Sandhopper. 2, Serolis Antarctica. 3, Balanus tintinnabulum. 4, Common Prawn. 5, Common Shrimp. 6, Cuma scorpioides. 7, Acorn Barnacle. 8, Common Edible Crab. 9, Northern Stone Crab. 10, Hermit Crab. 11, Thornback Crab. 12, Robber Crab. 13, Common Lobster.

Crustacea is sometimes based upon the successive metamorphoses which the higher Crustaceans undergo before reaching the adult form. Thus the first stage of the lobster embryo is that of a minute object with three pairs of limbs, known as the Nauplius-form; in the second, or Zoëa-stage, the cephalo-thorax is provided with anterior, posterior, and lateral spines; the final form being reached by a series of moultings. But for practical purposes the Crustacea may be considered as ranging themselves under four sub-classes—the Cirripedia, the Entomostraca, the Podophthalmia, and the Edriophthalmia. Of these, the Cirripedia are represented by the barnacles; the Entomostraca by the cyclops, daphnia, etc.; the Podophthalmia by the shrimps, prawns, lobsters, etc.; the Edriophthalmia by the fish-lice, wood-lice, beach-fleas, etc.—BIBLIOGRAPHY: T. H. Huxley, *The Crayfish*; W. T. Calman, *The Life of Crustacea*.

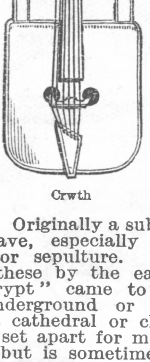
CRUTCHED FRIARS. An order of friars established at Bologna in 1169, and so named from their adopting the cross as their special symbol. It originally formed the head of their distinctive staff; afterwards they wore it in red cloth on the back and breast of their blue habit. They came to England in the thirteenth century, their first appearance being at a Synod of the Diocese of Rochester in 1244. They established eight or nine houses in England, the first being either at Colchester or at Reigate, founded in 1245. They gave their name to the locality near Tower Hill, London, called Crutched Friars.

CRUZA'DO. A Portuguese coin. The old cruzado or cruzado-velho is worth 400 reis, or 1*s.* 9½*d.*; the new cruzado, cruzado-novo or pinto, dating from 1722, was worth 480 reis, or 2*s.* 1⅛*d.* The monetary system was changed in 1931.

CRWTH (kruth). A Welsh name for a kind of violin with six strings, formerly much used in Wales. Four of the strings were played on by a bow, and two were struck or twitched by the thumb. Its general length was 22 inches, and its thickness 1½ inches.

CRY'OLITE (Gr. *kryos*, frost, and *lithos*, stone), $AlF_3.3NaF$. A mineral, a native fluoride of aluminium and sodium, found at Evigtok in Greenland, whence it is exported. It is pale greyish-white or yellowish-brown, occurs in masses of a foliated structure, and has a vitreous lustre. It has been employed in the extraction of aluminium, and in the manufacture of a hard porcellaneous glass of great beauty. In addition to the Evigtok deposit, cryolite has been discovered in the Urals.

CRYOPH'ORUS (Gr. *kryos*, frost or cold). An instrument for showing the diminution of temperature in water by its own evaporation. Wollaston's cryophorus consists of two glass globes united by a moderately wide glass tube. Water is poured in and boiled to expel the air, and while the water is boiling the apparatus is hermetically sealed. When the instrument is to be used, the water is run into one of the globes, and the other is buried in a freezing-mixture. The aqueous vapour in this globe being thus condensed, a vacuum is produced, fresh vapour rises from the water in the other globe, which is again condensed, and this proceeds continuously till the water remaining in the globe has been, by the evaporation, cooled to the freezing-point.



Crwth

CRYPT. Originally a subterranean cell or cave, especially one constructed for sepulture. From the usage of these by the early Christians, "crypt" came to signify a church underground or the lower story of a cathedral or church. It is usually set apart for monumental purposes, but is sometimes used as a chapel. The crypt is a common feature of cathedrals, being always at the east end, under the chancel or apse.

The earliest crypts in England are those of Hexham and Ripon, the largest that of Canterbury Cathedral; that of Glasgow Cathedral, rendered celebrated by Sir Walter Scott in *Rob Roy*, and formerly used as a separate church, is one of the most perfect pieces of architecture in Britain. Among domestic and secular crypts the finest example in England is that beneath the Guildhall of London (1411).

CRYPTOG'AMOUS PLANTS, or CRYPTOGAMIA. In botany, the division embracing the lower classes of plants having no evident flowers. They are divided into Thallophytes, including Algæ, Fungi, and some minor groups; Bryophytes, comprising liverworts and mosses; and Pteridophytes, or Vascular Cryptogams, comprising ferns, horse-tails, and club-mosses. The term is no longer an appropriate one, as the reproductive processes of the groups in question are now at least as well understood as those of flowering plants.

CRYPTOG'RAPHY (Gr. *kryptos*, secret, and *graphein*, to write), the art of writing in secret characters or cipher, or with sympathetic ink. The simplest method consists in choosing for every letter of the alphabet some sign, or another letter or group of letters. Thus the letter of Charles I. to the Earl of Glamorgan with respect to the Catholics of Ireland was composed in an alphabet of twenty-four strokes variously placed about a line. The names in the records of the Clan-na-Gael Society were written in a cipher formed by taking in each case the letter previous to that intended; and the cipher devised by Francis Bacon consisted in an alphabet formed by different arrangements of the letters *a* and *b* in groups of five.

All these methods, however, are easily deciphered by experts, as also is that employed by the Earl of Argyle in his plot against James II., in which the words of the letter were set down at concerted distances, the intervals being filled up with misleading words. Even the more complex, however, present, as a rule, only temporary difficulty to an expert. The facts that the most frequently recurring letter in the English language is the letter *e*, that the most common double vowels are *ea* and *ou*, and that *r*, *s*, and *t* are the most frequent terminal letters, are of no small assistance in forming a key to any given cryptogram.

On active service the principal ciphers employed were the Playfair cipher and the B.A.B. code. In the Playfair the letters of the text are enciphered in pairs, and one letter of a pair is represented in cipher by the same letter only when the other letter of the pair remains the same. The cipher cannot be read without knowing the key-word, which is changed from time to time. It is practically insoluble, but not easy to read quickly. The B.A.B. code consists of numbers; there is an alphabet of numbers, and a phrase-book containing phrases represented by numbers. A correction (either plus or minus) is made for the code from time to time, so that the number written down is different from that representing the desired phrase. It is impossible to decode this cipher without possessing the code-book and knowing the current correction.

In mediæval and modern times many scholars turned their attention to cryptography, such as John Trithemius, Abbot of Sponheim, Anastasius Kircher, and Kaspar Schott. An example of the relative frequency of letters being used to solve a cryptogram is found in Poe's tale *The Gold Bug*.—BIBLIOGRAPHY: A. T. Pepler, *Cryptography*; M. L. H. Josse, *La cryptographie et ses applications à l'art militaire*.

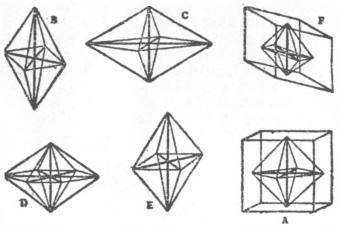
CRYSTAL and CRYSTALLOGRAPHY. A crystal, in chemistry and mineralogy, is any body which, by mutual attraction of its particles, has assumed a more or less symmetrical form bounded by plane surfaces. As a rule, crystals are produced by separation from solution, by solidification of a body from the molten state, or by sublimation.

The most marked feature of a crystal is its regularity of form, and crystals usually show some kind of symmetry, with respect either to a point, a plane, or an axis. A crystal has a point of symmetry when for each face on the crystal there is another parallel to it on the other side of the crystal. It has a plane of symmetry when an imaginary plane can be drawn through it so that the one half is the mirror-image of the other. A crystal has an axis of symmetry when it can be rotated about an imaginary line drawn through the centre so that the faces interchange their positions at least once in rotation through 360°.

Crystallography, the description of crystals, was developed as a science by Romé de l'Isle and René Just Haüy in Paris between 1772 and 1822, and has become from that time onward one of the most important means of discriminating between mineral species, and of connecting chemical constitution with physical structure. Instruments (goniometers) had to be devised to measure the exact angles between crystal faces, and the foundations of the science were triumphantly established on measurements that were accurate within only half a degree. The crystallographic systems, four at first, and then six, were thus formulated as divisions under which natural crystals—and all crystals are really natural—could be grouped.

The discovery of the more or less symmetrical disposition of the angular measurements led to the conception of axes intersecting in a central point within each form to which the plane faces might be referred. The angles between these axes in the systems with low symmetry are varied to suit some typical form commonly met with, so as to lead to a simple "reading" of the crystal.

Haüy made the most notable advance in the whole principles of crystallography when he discovered his "law of rationality," and showed that, if we erect at our convenience three axes of reference within a crystal of any given mineral species, and determine the relative distances from the point of intersection of these axes at which a plane (say a pyramid plane) cuts them, the distances or



Crystallographic Systems

A, Cubic. B, Tetragonal. C, Rhombic. D, Hexagonal. E, Monoclinic. F, Triclinic.

intercepts cut off by any other form of the same species bear a rational relation to those first determined. That is, the geometrical relations between forms occurring in the same species are far simpler than might have been supposed. Along two or more axes our typical pyramid or prism plane may mark out distances that we may call unit intercepts, though these distances may differ among themselves; any other pyramid or prism plane in the same species is found to cut these same axes so that the ratio between the new intercepts thus formed and the units gives figures that are rational. For convenience, we may consider a plane cutting two axes only, and parallel to the third. The unit intercepts for these two axes may be stated as 1 : 1. Variations on the second axis will give 1 : 2 or 1 : 3 or 1 and some simple fraction of the unit on the second axis, and the numbers involved rarely exceed the value 7. The methods adopted for the notation of crystal faces are based upon this discovery, and the notation of W. H. Miller of Cambridge, put forward in 1838, which regards the unit form as one within which the variants may be constructed by fractional measurements along the axes, has secured universal adoption.

The symbols in this notation represent the denominators of fractions, the numerators of which are the unit lengths, each of these units being represented as 1. The axes are treated in a definite order, and the symbol (125) thus represents a face that cuts the first axis selected at unit distance, the second at half the unit distance for that axis, and the third at one-fifth the unit distance for that axis. The unit "axiol" ratio, which might be represented in symbols by 1 : 1 : 1, is expressed in numbers to the nearest convenient point of decimals; these values are not necessarily rational in regard to one another, except in the most symmetrical of the systems.

It has been now shown that thirty-two classes of crystals with varying degrees of symmetry may occur within the limitations imposed by the law of rationality. Almost all these are already known to be realized in natural forms. These classes are assigned to the six old-established systems, given below; but seven systems are now very generally recognized, owing to the division of the hexagonal system into two, the hexagonal and the trigonal. The names for the six systems are:

(1) **Cubic or Regular System** (fig. A).—Crystals of this system can be referred to 3 axes of equal length, and all at right angles to another. In its simplest form this system is represented by the cube. Many substances crystallize in this system, such as common salt, fluor-spar, and the alums; the latter crystallize in regular octohedra, which is a modification of the simple cube.

(2) **Tetragonal System** (fig. B).—Crystals are referred to 3 axes, two of equal length, one longer or shorter than the other two, and all at right angles to one another. Substances crystallizing in this system are tinstone and copper pyrites.

(3) **Rhombic or Orthorhombic System** (fig. C).—Crystals are referred to 3 axes, all unequal and all at right angles to one another. Substances crystallizing in this system are potassium nitrate and magnesium sulphate.

(4) **Hexagonal System** (fig. D).—Crystals referred to 4 axes of equal length, three in one plane intersecting at 120°, the fourth at right angles to the plane of the other three. Substances crystallizing in this system are ice, quartz, and calcspar.

(5) **Monoclinic System** (fig. E).—Crystals referred to 3 axes of unequal length, two not at right angles, and

the third at right angles to the plane of the other two. Substances crystallizing in this system are ferrous sulphate and gypsum.

(6) **Triclinic System** (fig. F).—Crystals referred to 3 axes of unequal length, none of them at right angles. Substances crystallizing in this system are hydrated copper sulphate, manganese spar.

Some substances crystallize in more than one system, and are termed *polymorphous*. Calcium carbonate may crystallize in the hexagonal system as calcite, or the rhombic system as arragonite, according to the conditions of crystallization. Calcium carbonate is termed a *dimorphous substance*. When substances crystallize in the same form, and may be made to replace one another without altering the crystalline form, they are known as isomorphous. Potassium chloride and potassium iodide are isomorp hous.

The relations of the optical and chemical properties of crystalline substances to their crystallographic forms have proved a fertile and fascinating study, which has depended largely on successive refinements in the goniometers employed.—BIBLIOGRAPHY : W. J. Lewis, *Treatise on Crystallography* ; A. E. H. Tutton, *Crystallography and Practical Crystal Measurement* ; T. L. Walker, *Crystallography*.

CRYSTAL-GAZING, or **CRYSTAL-LOMANCY.** A mode of divining by means of a transparent body, as a precious stone or crystal globe. The operator first muttered over it certain formulas of prayer, and then gave the crystal (a beryl was preferred) into the hands of a young man or virgin, who received an answer from the spirits within the crystal.

CRYS'TALLINE ROCKS. While many rocks, such as common limestone or sandstone, are composed almost entirely of crystalline materials, the term crystalline rocks is reserved for those in which crystals or crystalline granules or patches have developed as the result of cooling from a molten state, or of processes of reconstruction under heating or pressure in the earth. Granites, dolerites, gneisses, schists, and many granular marbles thus come under this general name.

CRYSTAL PALACE. The building erected in 1854 at Sydenham, near London, from the materials, and in part after the design, of the Great Exhibition building of 1851, and originally designed as a great educational museum of art, natural history, and ethnology. It is composed entirely of glass and iron, and consists of a long and lofty nave intersected at regular distances by three transepts, of which the central is 384 feet long, 120 feet wide, and 168 feet interior height. It lies in about 200 acres of ground excellently laid out for recreation, and possesses many permanent attractions apart from the annual round of concerts, flower-shows, and pyrotechnical displays. Chief among these is the collection of casts of architectural ornaments and sculpture, arranged in the Egyptian, Greek, Roman, Alhambra, Byzantine, Mediæval, Renaissance, and Italian Courts.

The building and grounds, which had cost the Crystal Palace Company about £1,500,000, scarcely answered the expectations of the projectors, and the building was secured for the nation in Dec., 1913, thanks to the efforts and liberality of the Earl of Plymouth. The Crystal Palace was closed to the public on 10th Feb., 1915, and occupied by the Royal Naval Division. After the conclusion of the European War, the Crystal Palace once more resumed its former character, and in June, 1920, an Imperial War Museum was opened there.

CSABA (chå'bå), or **BEKESCSABA.** A town of Hungary, about 110 miles S.E. of Budapest, near the White Körös. There is a trade in grain, wine, and hemp. Pop. 49,295.

CSÁRDÁS (chär'däsh). A Hungarian national dance executed by one or any number of couples, beginning with slow movements, but gradually becoming extremely rapid, the movements and "steps" being largely left to the performers' own choice. There are various gipsy melodies that accompany it.

CSONGRAD (chon'gråd). A market town, Hungary, at the junction of the Körös with the Theiss, 72 miles S.E. of Budapest. Trade : cattle, cereals, and wines. Pop. 25,900.

CTENOID (ten'oid) **FISHES.** One of the four orders into which Agassiz classified fishes, the others being cycloid, placoid, and ganoid. The term is applied to the scales of fishes when jagged or pectinated on the edge like the teeth of a comb, as in the perch, flounder, and turbot.

CTENOPH'ORA, or **COMB-JELLIES.** A class of marine animals belonging to the sub-kingdom Cœlenterata, definable as transparent, oceanic, gelatinous Actinozoa, swimming by means of *ctenophores*, or parallel rows of cilia disposed in comb-like plates. They develop no coral. Pleurobrachia (or Cydippe) may be taken as the type of the order, which includes the Beroidæ and the Cestus or Venus's girdle.

CTE'SIAS. A Greek historian of about 400 B.C., contemporary with Xenophon and partly with Herodotus. He was a physician, and lived for seventeen years at the court of Persia. He wrote a history of Assyria and Persia (called *Persica*), of which little remains.

CTESIPHON, now **TAK-TI-KERSA** (The Throne of Chosroes). An ancient city of Mesopotamia, on the eastern bank of the Tigris, 25 miles S.E. of Baghdad. In ancient times it was the winter residence of the Parthian kings, and subsequently the capital of the Parthian kingdom. In the sixth century it was the seat of King Chosroes I. In A.D. 637 it fell into the hands of the Arabs, who devastated it, and its ruins were used to furnish material for Baghdad.—The village, built on the site, was the scene of a fierce battle between the British under Townshend and the Turks on 22nd Nov., 1915. Ctesiphon was, captured by the British, under Sir Stanley Maude, in March, 1917.

CUBA. The largest and most westerly of the W. India Islands, lying at the entrance to the Gulf of Mexico, about 150 miles from Florida and Yucatan. Its length is 750 miles; breadth, 20 to over 120; area, 44,164 sq. miles. Since the Spanish-American War of 1898 Cuba has been independent, and is now under its own Republican Government. The navigation of the coast is unsafe, on account of rocks and shoals, but there are many excellent and easily accessible ports and anchoring-places. The chief commercial ports and harbours are: on the north, Havana (the capital), Matanzas, Cardenas, Sagua, Remedios; on the south, Santiago, Trinidad, Cienfuegos, and Guantanamo.

Physical Features.—The surface exhibits various chains or groups of hills extending from west to east, and in the extreme south-east is a mountain range rising to the height of over 8000 feet. At the foot of the hills the country opens into extensive savannahs. A considerable number of small streams water the island on both sides.

Minerals.—Cuba is rich in minerals; those worked are chiefly copper and iron. Bitumen is plentiful, both in a liquid form and in a soft resinous state. There are many mineral springs, and on the north coast are extensive lagoons, which in dry years produce immense quantities of marine salt.

Climate and Rainfall.—The climate is hot and dry during the greater part of the year, but is, on the whole, more temperate than that of some other islands in the same latitude. Rain often descends in torrents from July to September, but no snow is known to fall on the highest mountains, though frost occurs occasionally.

Products.—The soil is fertile and the vegetation is exceedingly luxuriant. Forests of mahogany, ebony, cedar, fustic, and other useful woods, abound; and the fields are covered with flowers and odoriferous plants. The principal cereal cultivated is the indigenous maize, or Indian corn. Rice is also produced in many districts; but the principal crops are sugar and tobacco, with a little cotton, cocoa, coffee, and indigo. The best tobacco is grown in the district of Vuelta Abajo, near Havana. A considerable extent of country is appropriated also to cattle-breeding farms, and to farms on which fruit and vegetables are raised. The principal fruits are the pine-apple, oranges, shaddocks, plantains, bananas, melons, lemons, and sweet limes; figs and strawberries are also to be had.

Animals and Birds.—The most valuable domestic animals are the ox, horse, and pig, which form a large proportion of the wealth of the island; the sheep, goat, and mule are inferior in quality and numbers. Among the few indigenous mammals are two species of agouti and opossum. The sylvan birds are numerous and in great variety; but birds of prey are few, and snakes and reptiles are not very numerous. The shores abound with turtle, and in the deep gulfs and bays the alligator is found. The manati is met with in the deep pools of fresh water, and the iguana is not uncommon.

Commerce.—The manufactures are confined to the making of sugar, rum, molasses and cigars, and these, with tobacco, form the chief exports. Next in commercial importance rank mahogany and other valuable timber and fruit. The chief imports are grain and flour, salted provisions, brandy, wines, hardware, and cotton, linen, and woollen manufactures. The great bulk of the trade is with the United States. There is also a considerable trade between Cuba and Great Britain. The exports in 1930 were 167,410,669 dollars, the imports 162,452,268 dollars.

The metric system of weights and measures is in use. In 1914 a new coinage was introduced, with a gold peso of 1·6718 grammes (equal to the U.S. gold dollar) as the monetary unit. Internal traffic has been greatly furthered by road improvements and by railways; the length of the latter is now about 3200 miles. Steam-vessels ply between Havana and other parts

of the coast. The revenue and expenditure for 1932 both amounted to about 52,000,000 dollars.

History.—Cuba was first discovered on 28th Oct., 1492, by Columbus, who revisited it in 1494, and again in 1502. In 1511 the Spaniards formed the first settlement on the island, and the natives were soon extirpated. Negro slaves were introduced in 1524. Under Spain Cuba was governed under a Captain-General, and was often discontented. In 1868 a law was passed against slavery. In that year a struggle against the mother country began, and lasted for ten years. Slavery came to an end in 1886. In 1895 began another insurrection, which led to the interference of the United States and the independence of Cuba. The internal troubles of Cuba in 1906 caused the United States to step in and appoint a Provisional Governor, but in 1909 the Provisional Government came to an end, and the new President assumed office Various changes were made in the constitution in 1928, among them was the extension of the suffrage to women over twenty-one years of age.

Population.—The population in 1930 was 3,638,174, about 32 per cent. being coloured.—BIBLIOGRAPHY : M. Halstead, *Pictorial History of America's New Possessions*; H. Gannett, *A Gazetteer of Cuba*; C. B. Reynolds, *Standard Guide to Cuba*; A. H. Verrill, *Cuba: Past and Present*; G. C. Musgrave, *Cuba: the Land of Opportunity*; I. A. Wright, *The Early History of Cuba*; A. J. Robinson, *Cuba: Old and New.*

CUBE AND CUBOID. A cube is a regular solid body with all its edges of the same length, and having six equal square sides. If the sides are rectangles but not squares, the solid is called a cuboid. The content or volume of a cube or cuboid is obtained by multiplying together the numbers that measure the length, breadth, and height. *Cube Number and Cube Root in Arithmetic.*—If the same three numbers be multiplied together, the product is a cube number, and any of the original numbers is called its cube root. Example: $3 \times 3 \times 3 = 27$. 27 is a cube number, and 3 is its cube root.

CU'BEBS. The dried unripe fruit of *Cubēba officinālis*, or *Piper Cubēba*, A native of Java and other East India Isles, ord. Piperaceæ. They resemble black pepper, and are globular, wrinkled, blackish-brown, with a warm, even acrid taste and peculiar odour. They have been used in medicine from the time of Hippocrates, and are still employed in diseases of the urinary system.

CUBISM. The term now in general use to describe an important movement in modern art, originally applied in derision by the French painter Matuse. The movement originated in France, the first Cubist painting being exhibited in 1908, since when it has taken firm hold in England, Germany, and the United States.

It is in part a reaction against Impressionism (q.v.), which is mainly concerned with representing the external appearance of objects, and the charm of whose art depends much on association. Cubism, however, aims conveying in pictorial shape, not reality as seen by the eye, but its effect upon the mind and emotions of the artist. In other words, it attempts to give plastic expression to a mental state inspired by the contemplation of form. Thus, in common with many other modern painters, cubists take subjective experience as their starting-point; and on the basis thereof seek to create new and definite realities which will appeal directly to the emotions of the spectator, and not rely for their interest upon calling up associations. In this, they are in the classical as opposed to the romantic and realist traditions.

Cubism has been largely inspired by Cézanne, who sought to express the underlying reality and rhythm of nature by the ordered arrangement of three dimensional forms. He relied entirely upon natural forms, but many Cubist (and other) painters use abstract and arbitrary forms, so that their work becomes a kind of visual music. In the later work of Pablo Picasso, the most important Cubist painter, this tendency to disregard natural form altogether is well seen, and it has been pushed to its furthest point in the "colour harmonies" of the French "Orphists," and of Kandinsky and his followers in Munich. It is argued that in this way the artist makes the appeal of his work purely æsthetic, like that of the non-imitative and purely decorative arts.

The Cubist proper is distinguished by his limited use of colour and curved lines, which he regards as concessions to sentiment and "prettiness," and the systematic employment of planes arranged in a more or less harmonious sequence. This conception of all natural objects being analysable into a series of planes is not new; but the Cubists have pushed it considerably further than other painters. In this connection, Cubists have developed a "theory of simultaneity," which justifies the presentation on the same canvas of several aspects of the same object, and has its origin in the desire

to use natural forms arbitrarily for the purposes of design.

Prominent Cubist painters in France besides Picasso, are Georges Braque, Albert Gleizes, and Jean Metzanger. Derain, L'Hôte, and Marchand show similar tendencies, but are less extreme. They are distinct from the group inspired by Henri Matisse, sometimes known as "Les Fauves," which relies mainly on flowing and rhythmic lines and on colour as means of expression. English artists influenced by Cubist ideas include Roger Fry, Duncan Grant, and Wyndham Lewis.

Cubism must be distinguished from Futurism (q. v.), which is of Italian origin, and aims at representing states of mind simultaneously experienced by the artist before a certain scene, by means of various symbols and "force lines." — BIBLIOGRAPHY: W. H. Wright, *Modern Painting*; A. Salmon, *L'Art Vivant*; Albert Gleizes and Jean Metzanger, *Cubism*.

CUBIT. In the mensuration of the ancients, a long measure, equal to the length of a man's arm from the elbow to the tip of the fingers, or, say, equal to 18 inches. The cubit of the Romans was 17⅝ inches, and that of the Hebrews probably about the same.

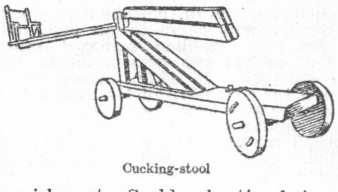
CUCHULLIN, or **CUCHULAIN** (Gael.; pronounced Koo-chu'lin (*ch* guttural), or Koo-hoo'lin). This ancient Irish-Gaelic hero figures in the Cuchullin cycle of prose romances which refer to events in the first century A.D. The oldest manuscripts are professedly copies, the language being that of the seventh century and earlier. Cuchullin was the "hound (*Cu*) of Culann," the Gaelic Vulcan and god of death. His name was changed from Set'anta after he slew the dog. The oldest Irish epic is called *Táin Bó Cúalnge* (The Cow Raid of Cooley). Queen Méave of Connaught waged war against her former husband to get possession of a famous bull. At the time the Ulster heroes were under a spell and unable to fight. Cuchullin, who escaped the spell, held up the invading army at a ford by demanding, according to Gaelic rules of chivalry, the right to engage warrior after warrior in single combat.

The *Táin* relates, in quite a Homeric manner, the various combats. Cuchullin is the Gaelic Achilles; he similarly terrifies opponents by his battle-roar and the light of his forehead. Although he delays the army of Méave until the Ulster warriors (of the "Red Branch") recover from the spell, the bull of Cooley is captured. Méave's army is driven back, and the story of the war concludes with a stirring fight between the captured red bull and the white bull of Connaught, the former being victorious. Cuchullin fights his last battle a few years later. He was the greatest of ancient Gaelic heroes, and died young. He took arms on a day when it was prophesied by a Druid or soothsayer:

> Who taketh arms upon this day of grief
> His name shall last for ever and his life be brief.

See DEIRDRE.—BIBLIOGRAPHY: E. Hull, *Textbook of Irish Literature* and *The Cuchullin Saga*; A. Nutt, *Cuchulainn, the Irish Achilles*; J. Rhys, *Celtic Heathendom*; D. A. Mackenzie, *The World's Heritage of Legend and Romance* (vol. i.).

CUCKING-STOOL. A kind of chair formerly used as an instrument of



Cucking-stool

punishment. Scolds, cheating bakers or brewers, and other petty offenders were placed in it, usually at their own doors, to be hooted at and pelted by the mob. It has been frequently confounded with the ducking-stool.

CUCK'OO (genus Cucŭlus). A type of the family Cuculidæ, in which the

Cuckoo

first and fourth toes are turned backwards, as in the not distantly related parrots. The note from which it derives its name is a lovecall used only in the mating season. The greater number of species belonging to the genus are confined to hot countries, more especially India and Africa, though some are summer visitants of colder climates. In America no true cuckoos are found, the genus Coccy-

zus, to which the so-called American cuckoo belongs, differing very essentially from them in its habits.

The species best known in Europe, the *Cucŭlus canōrus*, is a bird about the size of a small pigeon, though the length of the tail gives it at a little distance a strong resemblance to a hawk. The adult bird is ashy-grey, with a white breast barred across with narrow lines of greyish black; tail spotted and barred with white; bill black, touched at the gape with yellow; eyes and feet yellow. It appears in England about the middle of April (rarely in March), and in May begins to deposit its eggs in the nests of other species, giving the preference to those of the hedge-sparrow, meadow-pipit, or pied wagtail. The young cuckoo ejects from the nest its young companions, and monopolizes the attentions of its foster-parents, which feed it for about five weeks after it is fledged.

The young birds do not leave the country until the end of August or even September; but the adult birds commence their flight southward in July or at latest early in August. Their food consists largely of caterpillars (especially hairy ones), with cockchafers, moths, dragon-flies, and other insects. The female lays six or eight eggs, and each is placed in a different nest, by means of the bird's bill, as has been ascertained, the egg being first deposited on the ground.

CUCKOO-FLOWER, or **LADY'S-SMOCK** (Cardamine pratensis). A common and pretty meadow plant, ord. Cruciferæ, with pale lilac or white flowers. It is abundant in Britain, and has received its name because generally in flower when the cuckoo returns. It possesses antiscorbutic properties. Four other species of Cardamine are natives of Britain.

CUCKOO-PINT. The *Arum maculātum*, popularly known also by the names of "lords-and-ladies" and "common wake-robin."

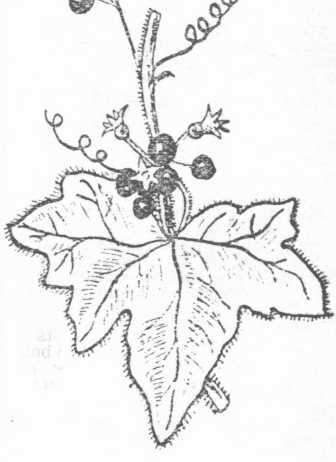
CUCKOO-SPIT, or **FROG-SPIT.** A froth or spume found on plants, being a secretion formed by the larva of a small homopterous insect (*Philænus spumarius*). *See* FROTH-HOPPER.

CU'CUMBER. The fruit of *Cucŭmis satīvus*, or the plant itself, belonging to the Cucurbitaceæ or gourd order, was cultivated by the ancient Egyptians, and is supposed to have been originally imported into Europe from the Levant. Though grown in England in the fourteenth century, it did not become generally used until after the reign of Henry VIII. It is an annual with rough trailing stems, large angular leaves, and yellow male and female flowers set in the axils of the leaf-stalks. Other species of the cucumber genus are *Cucŭmis Melo*, the common melon, and the water melon, *C. Citrullus*.

CUCUMBER-TREE (*Magnolia acuminata*). A fine American forest tree, so named from the appearance of its fruit.

CUCUR'BITA. The typical genus of the ord. Cucurbitaceæ. The pompion or pumpkin gourd is *C. Pepo*.

CUCURBITA'CEÆ. The gourd order, consisting of large herbaceous



Bryony
One of the species in the cucurbitaceæ order.

plants, annual or perennial, with alternate leaves palmately veined and scabrous, and unisexual flowers. The corolla is monopetalous, regular, and with five lobes; the petals usually either yellow, white, or green, and deeply veined; the fruit fleshy and succulent. The stems are scabrous, and the general habit is climbing or trailing, by means of tendrils.

The order contains at least fifty-six genera and about three hundred known species, and abounds in useful or remarkable plants, including the melon, gourd, cucumber, colocynth, and bryony. They are natives of both hemispheres, chiefly within the tropics. The annuals, however, are common in European gardens.

CUD. Bolus of hastily-swallowed fodder. It is received temporarily into the first of the four cavities of the stomach of ruminant mammals, such as sheep and oxen. It is returned at will into the mouth for leisurely mastication, the semi-fluid mass then reaching the true stomach, where it is digested. This is called chewing the cud.

CUD'BEAR. A purple or violet-coloured powder used in dyeing violet-purple and crimson, prepared from the *Lecanŏra tartarĕa* and other lichens growing on rocks in Sweden, Scotland, and elsewhere. The colour, however, does not last, and in Britain it is used chiefly to give strength and brilliancy to the indigo blues. There is little essential difference between cud-bear and archil.

CUDDALORE', or KUDALUR. A maritime town in India, Presidency of Madras, and district of South Arcot, 86 miles S. of Madras. It was formerly a place of great strength and importance, and still carries on a large land trade with Madras in indigo, oils, and sugar. It also exports grain and rice. Pop. 50,527.

CUD'DAPAH, or KADAPA. A district and town, India, Presidency of Madras. The district, of which the area is 8722 sq. miles, is traversed north to south by the Eastern Ghauts, and watered by the Pennar and its affluents. The forests contain much valuable timber and the minerals include iron-ore, lead, copper, and diamonds. Agriculture is in a flourishing condition, grain, cotton, and indigo being largely grown. Pop. 1,300,000.

Cuddapah.—The town lies on a small river of same name, an affluent of the Pennar, 140 miles N.W. of Madras. It exports indigo and cotton. Pop. 19,500.

CUDDESDON (kudz'don). A village of England, 6 miles south-east of Oxford, with a fine old cruciform church, the palace of the Bishops of Oxford, and Cuddesdon Theological College, founded in 1854 by Bishop Wilberforce, for twenty-four students.

CUD'WEED. The popular name in Britain for certain plants covered with a cottony pubescence, and belonging to the genera Gnaphalium, Filăgo, and Antennaria. The plant grows in wet, sandy situations.

CUDWORTH, Ralph. English divine and philosopher, born in 1617, died in 1688. He took his degree and fellowship at Cambridge in 1639; in 1644 was chosen master of Clare Hall; in the following year regius professor of Hebrew; and in 1654 master of Christ's College, Cambridge, where he spent the rest of his life. In 1678 he published his *True Intellectual System of the Universe wherein all the Reason and Philosophy of Atheism is confuted, and its Impossibility demonstrated* (folio)—a work of an exceedingly erudite kind, though tediously discursive in argument. His *Treatise Concerning Eternal and Immutable Morality* was published posthumously (1731).

CUEN'CA. A city of Spain, in New Castile, capital of Cuenca province, 85 miles E.S.E. of Madrid. Pop. 15,599. It was built by the Moors, stands on a craggy hill, and has a remarkable cathedral. Area of the province, 6636 sq. miles; pop, (1932), 312,215.

CUEN'CA. A town of Ecuador, next in importance to Quito and Guayaquil, with a cathedral and university. Pop. (1932), 42,000.

CUERNAVA'CA. A town of Mexico, capital of the state of Morelos, in a fertile valley, over 5000 feet above the sea-level. It has a school of agriculture and manufactures sugar. Pop. 7120.

CUE'VA, Juan de la. A Spanish poet, born about the middle of the sixteenth century. His works comprise several tragedies, a heroic poem, a large number of lyrics and ballads, and the first Spanish didactic poem—*The Art of Poetry*. No details are known of his life.

CUFIC. A term derived from the town of Cufa or Kufa in the former pashalic of Bagdad, and applied to a certain class of Arabic written characters. The Cufic characters were the written characters of the Arabian alphabet in use from about the sixth century of the Christian era until about the eleventh. They are said to have been invented at Cufa, and were in use at the time of the composition of the Koran. The Cufic Arabic alphabet has probably been developed from the Nabatæan characters. They were succeeded by the Neskhi characters, which are still in use.

Cufic Coins.—Under the name of Cufic coins are comprehended the ancient coins of the Mohammedan princes, which have been found in modern times to be important for illustrating the history of the East. They are of gold (*dinar*), silver (*dirhem*), and brass (*fals*), but the silver coins are most frequent, and numbers of them have been discovered on the shores of the Baltic, and in the central provinces of European Russia.

CUIRASS (kwi-ras'). An article of defensive armour, protecting the body before and behind, and com-

posed of leather, metal, or other materials variously worked. It was in common use throughout Europe in the fourteenth century. In England it fell into disuse in the time of Charles I., and in France a little later. It was reintroduced by Napoleon I., and the achievements of his cuirassiers led to its adoption for regiments of heavy cavalry in most European armies. In the British army only the 1st and 2nd Life Guards and Royal Horse Guards (The Blues) wear the cuirass.

CUIR - BOUILLY (kwēr'bŏ-i-li). Leather softened by boiling, then impressed with ornaments, used for shields, girdles, sword-sheaths, coffers, purses, shoes, and many other articles; also, in the sixteenth century, for hangings for rooms gilded and painted, and, when heightened by gold or silver, known as *cuir doré* or *cuir argenté*.

CUISHES, or **CUISSES** (kwish'es, kwis'ez). Defensive armour for the thighs, originally of buff leather, which was gradually superseded by plate iron or steel. Cuishes were introduced into England about the middle of the fourteenth century.

CUJAS, Jacques, or **CUJACIUS.** A distinguished French jurist, born about 1520; long professor of law at Bourges; died in 1590. He owed his reputation to the light shed by him on Roman law. He was the founder of the historical school of jurisprudence. A complete edition of his works was edited by Fabrot in 1658.

CULDEES'. A religious body or order, more especially associated with the Celtic branch of the Catholic Church in Scotland from the eighth to the thirteenth centuries, communities of Culdees being mentioned as living at various places, including St. Andrews, Glasgow, Iona, Dunkeld, Abernethy, Loch Leven, and Monymusk; while they were also known in Ireland, and are mentioned as existing in the north of England. The name is of Irish origin, and corresponds with that of the Irish fraternity *Céle Dé*, the early form used in Scotland being *Keledei*. The term Culdee has grown out of the form Culdeus, coined by Hector Bœce in his *Scotorum Historiæ*, 1526. Etymologically the name is believed to come from Celtic words meaning one who is an attendant, associate, or closely connected with God, and to have been first applied to Irish hermits or anchorites, like the Latin designation *Deicolæ* or "God-worshippers."

The Culdees or Keledei of Scotland are first mentioned early in the eighth century, and according to Skene's investigations they "originally sprang from that ascetic order who adopted a solitary service of God in an isolated cell as the highest form of religious life and who were termed *Deicolæ*; that they then became associated in communities of anchorites, or hermits; that they were clerics, and might be called monks, but only in the sense in which anchorites were monks"; and that they first made their appearance in the eastern districts of Scotland, succeeding the Columban monks—or monks of the Church founded by Columba—who were driven from the kingdom of the Picts in the beginning of the eighth century.

Formerly very erroneous ideas prevailed regarding them, some holding that they were the earliest teachers of Christianity in Scotland, that their teaching was free from some of the doctrines most characteristic of the Roman Church, and that the ecclesiastical system established by them closely resembled the Presbyterian, and that this led to their suppression by the dominant body.

The Culdees no doubt had some distinctive peculiarities, but not so great as to prevent them from becoming amalgamated with the Roman Church in its fully developed condition in Scotland. Though living in communities devoted to religion and in a manner somewhat similar to monks, they did not belong to any of the monastic orders, might possess private property of their own, and might even be married. Andrew Lang, in his *History of Scotland*, compares them to married fellows of an English college.—BIBLIOGRAPHY: W. Reeves, *The Culdees of the British Islands*; W. F. Skene, *Celtic Scotland*.

CULI'CIDÆ. A family of dipterous insects, including gnats and mosquitoes. The eggs are laid in stagnant water, in which the larval and pupal stages of the life-history are passed. The females are blood-suckers, and those of certain species disseminate the germs of serious diseases, e.g. malaria (species of Anopheles), yellow fever (*Stegomyia fasciata*), elephantiasis (chiefly by *Culex fatigans*). The common house-gnat of Europe (*Culex pipiens*) is not a disease-carrier.

CULLEN, William. Physician and medical writer, born at Hamilton, Lanarkshire, in 1710, died in 1790. He studied medicine at Glasgow, London, and Edinburgh, practised at Hamilton, and in 1740 took the

degree of M.D. at Glasgow, to which he removed in 1744, becoming in 1751 regius professor of medicine. In 1756 he was elected to the chemical professorship in the University of Edinburgh, and gave clinical lectures in the infirmary, and in 1760 was made lecturer on *materia medica*, and afterwards on the practice of medicine, conjointly with Dr. Gregory. In 1773 he became sole occupant of the chair of the practice of physic. His principal works are: *A Treatise of Materia Medica, Synopsis Nosologiæ Methodicæ, Clinical Lectures*, and *First Lines of the Practice of Physic*.

CULLEN. A seaport and parliamentary burgh of Scotland, county of Banff; chief occupation, fishing. Pop. (1931), 1688.

CULLERA (kụl-yā'rá). A town, Spain, province and 25 miles S. by E. of Valencia. Pop. 12,200.

CULLINAN DIAMOND. Largest known diamond. It weighed 3025¾ carats (1½ lbs.) and was discovered in 1905 at the Premier Mine in the Transvaal on ground belonging to T. Cullinan. In 1907 it was presented to King Edward VII. It was cut into two stones, one, the Star of Africa, being set in the king's sceptre and the other in his crown.

CULLO'DEN MOOR. A heath in Scotland, 4 miles E. of Inverness, celebrated for the victory obtained 27th April, 1746, by the Duke of Cumberland over Prince Charles Edward Stuart (the Pretender). The battle was the last fought on British soil, and ended the attempts of the Stuarts to recover the throne of England.

CULM. In botany, the jointed and usually hollow stem of grasses, generally herbaceous, but woody and tree-like in the bamboo.

CULM. In geology, an anthracite and sometimes poor coal, often friable and mixed with shale. The name seems to have the same origin as coal. In German geology, the *kulm* is equivalent to the Lower Carboniferous series.

CULMINATION. In astronomy, the passing of a heavenly body across the meridian, when it has reached the highest point (*culmen*) of its diurnal apparent path in the sky.

CULROSS (kō'ros). A royal burgh, Scotland, County Fife, on the north shore of the Forth. Pop. (1931), 495.

CULTIVATOR. An agricultural implement with long, strong, broad-pointed iron teeth or tines, for tearing up or loosening the soil; also called a horse-hoe or grubber.

CULTURE. Cultivation or the art of cultivating the land, "the act of tilling and preparing the earth for crops." The word is also employed to denote the refinement and improvement of the mind. By culture we mean intellectual development.

It is often used as synonymous with civilization, as by E. B. Tylor in his *Primitive Culture*. There is, however, a difference between civilization and culture. The former represents the outer technical progress of humanity which distinguishes the civilized from the savage man, whilst the latter is the inner intellectual development. By civilization in a narrower sense, we mean progress in the mastery of nature, but it is not culture in itself. On the one hand civilization is the result of one of the factors of culture, i.e. knowledge, and on the other it is a means to culture.

Matthew Arnold's definition of culture is "reading, but reading with a purpose to guide it, and with system." *See* CIVILIZATION.

CUL'VERIN. A long and slender cannon used in the sixteenth century. It generally carried a ball of about 18 lb.; the demi-culverin carried one of about half that weight.

CU'MÆ. A very ancient city of Italy, in Campania, the oldest colony of the Greeks in Italy, founded about 1030 B.C. by colonists from Chalcis, in Eubœa, and from Cyme (Gr. *Kumē*) in Asia Minor. It founded Naples (Neapolis), and in Sicily Zancle or Messina. In 420 B.C. Cumæ was taken by the Campanians, and came with them under the power of Rome (345 B.C.). It was destroyed A.D. 1207, and only a few ruins now exist. Underneath the Acropolis are a number of grottoes and caverns, one of which was the seat of the Cumæan Sibyl.

CUMANA'. A town of Venezuela, capital of the state of Sucre. It is the oldest European city in the New World, having been founded in 1523. It lies near the mouth of the Gulf of Cariaco, and has a good roadstead in Cumana Bay, with a trade in cacao, sugar, and tobacco. Pop. 19,000.

CUMARIN, or **COUMARINE.** An aromatic substance, found in many plants. It is the cause of the "hay" scent of sweet vernal grass, woodruff, melilot, etc., when the plants are bruised or allowed to wither. The largest amount is present in tonka beans—the seeds of *Dipteryx odorata*, a leguminous tree of tropical America, from which it is extracted for use in perfumery, in flavouring snuff, etc.

CUMBERLAND, Ernest Augustus. Only son of Ernest Augustus, Duke of Cumberland, and of Thyra, daughter of King Christian IX. of Denmark. He was born in 1887, and in 1913 married the only daughter of the ex-Kaiser Wilhelm II. As son-in-law of the Kaiser he was allowed to succeed to the duchy of Brunswick-Lüneburg, which his father had inherited in 1884, but was not allowed to take possession of, on account of his refusal to renounce his rights to Hanover. The Duke of Brunswick, was deposed on 8th Nov., 1918, and the duchy was proclaimed a republic.

CUMBERLAND, Richard. Dramatic and miscellaneous writer, born at Cambridge 1732, died in 1811. After studying at Westminster and Cambridge, he became private secretary to Lord Halifax, who bestowed on him a few years later a clerkship of reports in the office of Trade and Plantations. After one or two failures in writing for the stage, his *West Indian*, brought out by Garrick in 1771, proved eminently successful, and it was followed by the less popular *Fashionable Lover*, *The Choleric Man*, *The Note of Hand*, and *The Battle of Hastings*. In 1775 he became Secretary to the Board of Trade, and in 1780 was employed on a mission to Lisbon and Madrid, but, failing to satisfy the ministry, was compelled to retire.

His subsequent works include his *Anecdotes of Spanish Painters*, *The Observer*; the novels of *Arundel*, *Henry and John de Lancaster*, the poem of *Calvary*, the *Exodiad* (in conjunction with Sir James Bland Burges), a poem called *Retrospection* and the *Memoirs* of his own life. He also edited the *London Review*. His portrait by Romney is in the National Portrait Gallery.—Cf. George Paston, *Little Memoirs of the Eighteenth Century*.

CUMBERLAND, William Augustus, Duke of. Second son of George II. of England, born in 1721, died in 1765. At the battle of Dettingen he was wounded when fighting at the side of his father, and though unsuccessful at Fontenoy, where he had the command of the allied army, he rose in reputation by somewhat brutally subduing the second Jacobite Rebellion. In 1747 Cumberland was defeated by Marshal Saxe at Lauffeld, and in 1757 he lost the battle of Hastenbeck against D'Estrées, and concluded the Convention of Klosterzeven, by which 40,000 English soldiers were disarmed and disbanded, and Hanover placed at the mercy of the French. He then retired in disgrace from his public offices, and took no active part in affairs.—Cf. A. N. Campbell Maclachlan, *William Augustus, Duke of Cumberland*.

CUM'BERLAND. The extreme north-western county of England. Length, north to south, 75 miles; extreme breadth, 45 miles; area, 973,086 acres, rather more than a half of which is under cultivation.

Physical Features.—There is great variety of surface in different parts. Two ranges of lofty mountains may be traced—one towards the north, to which belongs the ridge called Crossfell (2892 feet); and the other to the south-west, of which the highest peak is Skiddaw (3053 feet). Other important summits are: Scaw Fell Pikes (3210 feet), Scaw Fell (3162 feet), Helvellyn (3118 feet), and Bow Fell (2960 feet). The two largest rivers are the Eden and the Derwent. The county embraces part of the "Lake Country," of England. The largest lakes are Derwentwater, Bassenthwaite, Loweswater, Crummock, Buttermere, Ennerdale, Wastwater, Thirlmere, and part of Ullswater.

Minerals and Occupations.—Cumberland is rich in minerals, including lead, gypsum, zinc, and especially coal and rich hematite iron-ore. In the western division of the county there are a great many blast-furnaces, and works for the manufacture of steel and finished iron. The principal crops raised are oats, barley, wheat, and turnips, but the bulk of the enclosed lands is sown in clover and grass. The rearing of cattle and sheep and dairy-farming are engaged in to a considerable extent.

Chief Towns.—Carlisle is the county town; the other principal towns are the seaports Whitehaven, Workington, and Maryport; and the inland towns Penrith, Cockermouth, and Keswick.

For parliamentary purposes the county is divided into four divisions, each returning one member to the House of Commons. Pop. (1931), 262,897.—Cf. *Cumberland* (Victoria County History).

CUMBERLAND. A town of the United States, capital of Alleghany County, Maryland, on the Potomac, 179 miles by rail from Baltimore. It is on the edge of the great coal-basin of the same name, and iron is also largely worked in the vicinity. Pop. 37,747.

CUMBERLAND. A river of the United States which runs through Kentucky and Tennessee into the Ohio, having a course of about 600

miles, navigable for steamboats to Nashville, nearly 200 miles.

CUMBERLAND MOUNTAINS. In Tennessee, part of a range of the Appalachian system, rarely exceeding 2000 feet in height.

CUMBERLAND PRESBYTERIANS. A small American sect, so named from the Cumberland country in Tennessee, founded early in the eighteenth century, and holding Calvinistic doctrines, except in regard to predestination. It has three universities and several colleges connected with it.

CUM'BRAE, or CUMBRAY, the Great and Little. Two Scottish islands in the Firth of Clyde, belonging to the county of Bute. The Great Cumbrae is 3¾ miles in length and 2 miles in breadth; area, 3120¼ acres. The only town upon it is Millport, a seaside resort. The Little Cumbrae is 1¾ miles in length by a mile in breadth; area, 700 acres. Pop. of both the Cumbraes (1931), 2165.

CUM'BRIA. An ancient British principality, comprising, besides part of Cumberland, the Scottish districts Galloway, Kyle, Carrick, Cunningham, and Strathclyde, its capital being Alcluyd or Dumbarton. It was possibly at one time the chief seat of the power of Arthur, and in the sixth century was an important and powerful kingdom. It speedily, however, fell under Saxon domination, and early in the eleventh century was given by Edmund of Wessex to Malcolm of Scotland to be held as a fief of the crown of England. The name still survives in Cumberland.

CUMBRIAN MOUNTAINS. A range of hills, England, occupying part of the counties of Cumberland, Westmoreland, and North Lancashire. The mountains rise with steep acclivities, enclosing in some parts narrow but well-cultivated valleys, with numerous picturesque lakes, this being the English "Lake Country" so much frequented by tourists.

CUM'IN, or CUM'MIN. An umbelliferous plant (*Cumīnum Cymīnum*) which grows wild in Egypt and Syria, and is largely cultivated in Sicily and Malta, whence it is exported. The fruit, called cumin seeds, is of a light brown colour, with an aromatic smell and caraway-like taste, and possesses stimulating and carminative properties.

CUMMING, Roualeyn George Gordon. The "Lion-hunter," a Scottish sportsman and writer, born in 1820, died at Fort Augustus, in Scotland, in 1866. He entered the army, served some years in India, joined the Cape Rifles, and between 1843 and 1849 made five hunting expeditions into various parts of Africa. On his return to England he exhibited his collection of trophies in London and elsewhere, finally establishing it at Fort Augustus. Records of his adventures are to be found in his *Five Years of a Hunter's Life* (1850), and *The Lion-hunter of South Africa* (1856).

CUMNOCK, Old. A town of Scotland, Ayrshire, on the Lugar, and on the Glasgow and South-Western Railway main line, with extensive collieries, quarries, and manufactures of woollens. Pop. (1931), 3653.—**New Cumnock** lies 5½ miles to the south-east, in the same mineral district. Pop. 6281.

CUMQUAT. *See* KUMQUAT.

CU'MULATIVE VOTE. The system by which every voter is entitled to as many votes as there are persons to be elected, and may give them all to one candidate, or may distribute them among the candidates, as he thinks fit. The principle was first introduced into Britain by the Elementary Education Act of 1870, but it was not recognized in any elections save those of the school boards. In Scotland it has been superseded by the principle of proportional representation in the election of the education authorities (Education Act of 1918).

CUM'YN, COMYN, or CUMMING. A family whose name appears frequently in the early history of England and Scotland. It had its original possessions near the town of Comines in France, and from one of the branches sprang the historian Philip de Comines. The English Comyns came over with the Conqueror, and Robert Comyn was sent by William with 700 men to reduce the northern provinces. His nephew became Chancellor of Scotland, about 1133, and in the middle of the thirteenth century the family counted among its members four Scottish earls. In the beginning of the fourteenth century it was almost annihilated by Robert Bruce, who slew the son of its head (the Lord of Badenoch) in Dumfries. The Comyns who escaped settled down in the English court, and established important connections.

CUNARD' LINE. A famous British line of steamships, whose routes are from Liverpool, Southampton, London, Bristol, Rotterdam, and Antwerp to New York, Boston,

Philadelphia, and Baltimore. It owes its name to Sir Samuel Cunard (1787-1865), Canadian merchant and shipowner, who, coming to England in 1838, was associated with George Burns of Glasgow, and David M'Iver of Liverpool, in establishing the British and North American Royal Mail Steam Packet Company. This company in 1840 dispatched from Liverpool *The Britannia*, a wooden paddle vessel, the first mail steamship to cross the Atlantic. In 1878 the company was converted into a limited liability company, the present name—the Cunard Steamship Company, Limited—being at the same time adopted.

In 1914 the company owned a fleet of splendid steamers, aggregating some 330,000 tons, and comprising the *Campania, Lucania, Caronia, Carmania, Lusitania*, and *Mauretania*, the last two being turbine vessels of over 30,000 tons each, built under arrangement with the British Government, which in 1903 agreed to lend the company £2,600,000 at 2¾ per cent., and to grant an annual subsidy of £150,000, obtaining in return the right of hire or purchase over any of the company's vessels at pleasure. During the European War the company lost more than twenty steamers by enemy action. The *Lusitania* was sunk by the Germans on 7th May, 1915. In 1930 the Cunard fleet consisted of 18 big liners ranging from 14,000 to 53,000 tons. Two huge new liners were projected in the same year. Unfortunately work on one of the Cunard liners was arrested and thousands of men were thrown out of work in the Clyde district.

CUNDINAMARCA. One of the departments of the Republic of Colombia. Area (estimated), 8674 sq. miles; pop. 1,056,570.

CUNE'IFORM WRITING (Lat. *cuneus*, a wedge, and *forma*, a shape), the name applied to the wedge-shaped characters of the inscriptions on old Sumerian, Babylonian, Assyrian, and Persian texts. They appear to have been invented by the primitive Sumerian inhabitants of Lower Mesopotamia. They were borrowed with considerable modification by the intruding Akkadians, Babylonians, and Assyrians, who were Semites by race and spoke different languages. Cuneiform writing was used by the Hittites, Egyptians, etc., for international correspondence, Babylonian being the ancient language of diplomacy.

In 1884 the late Professor Joseph Halévy denied the existence of the Sumerian language, and claimed that it was merely a cabalistic script invented by Semitic priests. Many scholars have adopted his theory, while others continue to believe in the existence of the Sumerian language. Its use, however, ceased shortly after the reign of Alexander the Great; and after the lapse of nearly two thousand years it was doubted by many if the signs had ever had an intelligible meaning. The first hints towards decipherment were given by Karstens Niebuhr late in the eighteenth century; and the labours of Grotefend, Rask, Burnouf, Lassen, Rawlinson, Smith, and other investigators slowly perfected the means of translation.

Most of the inscriptions first discovered were in three different languages and as many varieties of cuneiform writing, the most prominent, and at the same time the simplest and latest, being the Persian cuneiform writing with about sixty letters. Next older in time and much more complex is what is designated the Assyrian or Babylonian system of writing, consisting of from 600 to 700 characters, partly alphabetic, partly syllabic, or representing sound groups. Lastly come the Sumerian inscriptions, the oldest of all, originally proceeding from a people who had reached a high state of civilization three thousand years before Christ, and whose language ceased to be a living tongue about 2000 B.C., but remained as the language of religion in Babylonia.

The most celebrated trilingual inscription is that at Behistun, cut upon the face of a rock 1700 feet high, and recording a portion of the history of Darius. The British Museum contains many thousands of inscribed clay tablets, cylinders,

Part of a Cuneiform Inscription

and prisms. *See also* BABYLONIA AND ASSYRIA. — BIBLIOGRAPHY: Isaac Taylor, *History of the Alphabet*; R. W. Rogers, *History of Babylonia and Assyria*, and *Cuneiform Parallels to the Old Testament*; Count Gobineau, *Traité des écritures cunéiformes*; D. Schrader, *Cuneiform Inscriptions and the Old Testament*; Thureau-Dangin, *Recherches sur l'origine de l'écriture cunéiforme*; Barton, *The Origin and Development of Babylonian Writing*; A. H. Sayce and T. G. Pinches, *The Tablet from Yazgat*; S. Langdon, *Sumerian and Babylonian Psalms*.

CUNE'NE. A river of South Africa, which enters the Atlantic after forming the boundary between the Portuguese and the former German territories here. It is also the name of one of the eight districts into which Angola is divided.

CU'NEO. *See* CONI.

CUNNINGHAM, Allan. Poet, born in 1784, at Blackwood in Dumfriesshire, died at London in 1842. In his eleventh year he was apprenticed to a stone-mason. Having been employed by Cromek to collect materials for his *Remains of Nithsdale and Galloway Song*, he sent instead his own productions, which were printed, but quickly recognized as being forgeries. He then proceeded to London, where he at first supported himself by journalism, but afterwards obtained a situation in the studio of Chantry, with whom he remained till his death.

His later works comprise the drama *Sir Marmaduke Maxwell*; the novels *Paul Jones*, *Sir Michael Scott*, and *Lord Roldan*; *Songs of Scotland*; *Lives of the most Eminent British Painters, Sculptors, and Architects* (1829); *The Works of Burns*, with notes and a life.

CUNNINGHAM, Peter. Son of the preceding (1816-69), is also known as the author of a series of works, including *The Story of Nell Gwynne*, *Life of Drummond of Hawthornden*, *Modern London*, and *Life of Inigo Jones*. He also edited Walpole's *Letters* and Goldsmith's *Works*.

CUNNINGHAME-GRAHAM, Robert Bontine. Scottish writer and traveller. Born in 1852, he was educated at Harrow and spent some years as a rancher in Mexico and South America. He developed strong Socialistic sympathies and from 1886-92 was M.P. for North Lanarkshire. Later he identified himself with the Scottish Nationalist Party, of which he was President in 1933. His books include volumes of short stories, lives of several Spanish adventurers and descriptions of his travels.

CUP AND RING MARKINGS. The name given by archæologists to a class of ancient markings on the surfaces of rocks and stones in various parts of the world, including the British Islands and other countries of Europe, as well as Asia and America. The cup markings are usually from 1 to 3 inches in diameter, and may be solitary or in groups, and are often surrounded by a ring or several concentric rings, which may also exist apart from any cup-mark, while spirals also are found, and often a straight groove or channel proceeds from a central cup, cutting through the connected rings, and so on.

As the spiral and rings are religious symbols in the Ægean area and in ancient Egypt, the probability is that they had elsewhere a religious significance. The marks are sometimes found under cover-slabs, and often in corridor tombs.

CUPAR, or CUPAR-FIFE (kū'pár). A royal, municipal, and parliamentary burgh of Scotland, county town of Fifeshire, on the River Eden, 9¾ miles W. of St. Andrews. Pop. (1931), 4596.

CUPAR-ANGUS. *See* COUPAR-ANGUS.

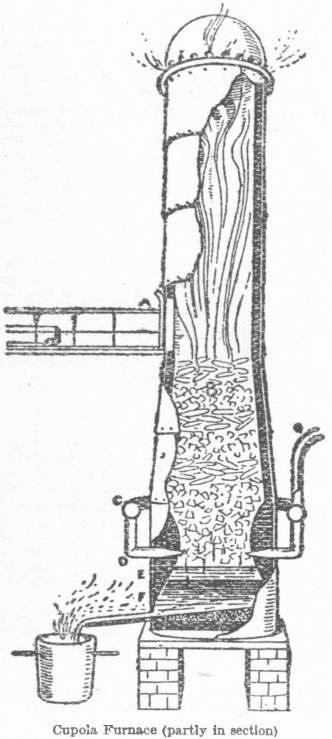
CUPELLATION. The extracting, refining, assaying, or "parting" of noble metals, e.g. gold or silver, etc., from some less valuable admixture, generally lead. The baser metals are oxidized by means of a hot forced draught, and the oxides sink into the *cupel*, or shallow porous cup, of bone-ash or calcium phosphate, leaving the noble metal usually in the form of a globule or "button."

CU'PID (Lat. *Cupīdo*). The god of love; corresponding to the Greek Erōs. He is represented as a winged boy, naked, armed with a bow and a quiver full of arrows. Cupid or Erōs was a favourite subject for genre painters of the degenerate Alexandrian school. The poems long falsely attributed to Anacreon, and many poems of the Anthology, recount the adventures and misadventures of Cupid. From Alexandria Cupid made his way into Roman poetry. He is the subject of a fine poem by Propertius (book iii., el. 3). The beautiful story of Cupid and Psyche was first told by Apuleius in his *Golden Ass*.

CU'POLA. In architecture, a spherical vault on the top of an edifice; a dome or the round top of a dome. The Italian word *cupola* signifies a hemispherical roof which

covers a circular building, like the Pantheon at Rome and the Round Temple of Vesta at Tivoli. The term is also applied distinctively to the concave interior as opposed to the dome forming its exterior.

CUPOLA. In metallurgy, an intermittent furnace used in foundries for melting iron, steel, and other metals.



Cupola Furnace (partly in section)

A, Charging door. B, Pig iron and fuel. C, Air belt. D, Twyer. E, Slag. F, Iron. G, Blast from fan.

It consists of an outer mild-steel or wrought-iron cylindrical shell, which tapers at the top. The shell is lined internally with fire-resisting brick resting upon a cast-iron bottom plate, which has an opening at the centre. When the furnace is in blast, this hole is covered with iron doors protected from the heat by a layer of sand. Near the bottom are two openings, one for inlet draught, and the other for withdrawing molten metal. Near the top is a third opening for charging the furnace, which, when working properly, requires from 172 to 224 lb. of coke to melt a ton of iron.

CUPPING. The application of a cupping-glass to a region of the skin for the purpose of bringing an increased amount of blood to the part. The cupping-glass is first held over a flame (spirit-lamp, match, etc.) so that the air in its interior becomes rarefied. It is immediately applied to the skin, and, as the heated air cools, a partial vacuum is produced which draws up the skin and underlying tissues slightly into the glass. This is *dry-cupping*. If small incisions are made in the skin previously, then, on application of the cupping-glass, blood is drawn off. This latter process is known as *wet-cupping*. As a means of treatment cupping is not now so frequently employed.

CUPRO-NICKEL ALLOYS. To impart strength and ductility to copper this metal is alloyed with various amounts of nickel, the product being called "cupro-nickel" or "nickel bronze." Alloys of 12 per cent. and 25 per cent. nickel are used for coinage in the United States and Germany respectively. A 3 per cent. nickel alloy is used for locomotive fire-boxes, a 25 per cent. alloy for the envelopes of bullets. Constantan contains 40 per cent. nickel, and is used for electrical resistances, owing to its low electrical temperature coefficient. Iron-constantan form a good couple for pyrometrical work. *See* ALLOY.

CUPULIF'ERÆ. A common name for the nat. ords. Betulaceæ and Fagaceæ, so called from the peculiar husk or cup (*cupule*) in which the fruit is enclosed. They are trees or shrubs, inhabiting chiefly the temperate parts of the northern hemisphere, and common in Europe, Asia, and North America. The chief genera are the oak, chestnut, beech, and hazel.

CURAÇAO (kō-rȧ-sā'ō). An island, Dutch West Indies, Caribbean Sea, 46 miles N. of the coast of Venezuela; 36 miles long and 8 miles broad; capital, Willemstad; principal harbour, Santa Anna. It is hilly, wild, and barren, with a hot, dry climate. Yellow fever visits it every sixth or seventh year. Fresh water is scarce, and serious droughts occur. The tamarind, coco-palm, banana, and other useful trees are reared—among them three varieties of orange, from one of which the Curaçao liqueur is made. Sugar, tobacco, cochineal,

and maize are also produced, but the staple exports are salt, and a valuable phosphate of lime used as a manure in its natural state, or made to yield valuable superphosphates.

The islands of Curaçao, Bonaire, Oruba (or Aruba), part of St. Martin, St. Eustache, and Saba, form the colony of Curaçao, which is a Dutch government, the residence of the Governor being at Willemstad. From the sixteenth century Curaçao was held in succession by the Spaniards, Dutch, and British, and finally ceded to Holland at the general peace in 1814. Pop. of the island, 45,191; of the colony, 71,769 (1931).

CURAÇAO, or **CURAÇOA.** A liqueur or cordial prepared from a peculiar kind of bitter orange grown in Curaçao, which has a persistent aromatic odour and taste. It is prepared from the yellow part of the rind, which is steeped in strong alcohol, the infusion being afterwards distilled and rectified and mixed with syrup. For the true orange, the common bitter orange of Europe is often substituted, and the genuine deep-yellow colour imitated by caramel. A lighter variety of Curaçao, made with fine brandy, is known as "Grand Marnier."

CURARE. A highly poisonous alkaloidal extract from the bark of *Strychnos toxifera* and related species, used as an arrow-poison by the Amazonian tribes. It is a brown or black brittle solid, and is a violent poison when injected hypodermically. Taken by the mouth it is not so poisonous, owing to its rapid excretion and to the destructive action of the gastric juices. It has both a paralysing and tetanizing action, the painful death by suffocation being probably due to paralysis of the muscles of the chest.

Medicinally it is used in tetanus, strychnine poisoning, and hydrophobia. Its composition varies with the source. "Bamboo" curare contains curare, $C_{19}H_{19}NO_3$, and the more poisonous tubocurarine, $C_{19}H_{22}O_4NOH$. "Gourd" curare contains the even more poisonous curarine, $C_{19}H_{25}ON_2OH$, whilst "Pot" curare contains protocurarine $C_{19}H_{14}O_3NOH$, which is the most poisonous of the group.

CURAS'SOW, or **HOCCO.** The name given to gallinaceous birds of the genus Crax, family Cracidæ; natives of the warm parts of America. The crested curassow (*Crax alector*), found in Guiana, Mexico, and Brazil, is a handsome bird, nearly as large as the turkey and more imposing in appearance, being of a dark-violet colour, with a purplish-green gloss above and on the breast; the abdomen is snow-white, and the crest golden.

Another species is the red curassow (*Crax rubra*), also a native of South America, and about the size of a turkey. The cashew-bird (*Pauxis galeata*) is called the galeated curassow.

CU'RATE. Properly an incumbent who has the care of souls; now generally restricted to signify the substitute or assistant of the actual incumbent. In the Church of England curacies are either *stipendiary* or *perpetual*. A stipendiary curate is one who is hired by the rector or vicar to serve for him, and may be removed at pleasure; a perpetual curate is one who is not dependent on the rector, but is supported by a part of the tithes or otherwise. By an Act of Parliament passed in 1868 perpetual curates were authorized to style themselves vicars.

CU'RATOR. In Scots law, the guardian of a minor or of a person incapable of managing his own affairs. The father is curator at common law of his minor children. A curator *ad litem* is a guardian appointed by the court to protect the interests of a minor during a litigation. Curators differ from tutors, whose duty it is to protect both the person and the property of their wards. A curator is concerned only with his ward's property. *See* CHILD and MINOR.

In learned institutions the person who has charge of the library or museum is often called the *curator*.

CURB. The general term for a hard and callous swelling on various parts of a horse's leg, as the hinder part of the hock, the inside of the hoof, beneath the elbow of the hoof, etc. No class of horse is wholly exempt, but hunters and light-bred animals are the most prone to this disease.

CURB-ROOF. In architecture, a roof in which the rafters, instead of continuing straight down from the ridge to the walls, are at a given height received on plates, which in their turn are supported by rafters less inclined to the horizon, so that this kind of roof presents a bent appearance, whence its name. Called also a *Mansard Roof*, from the name of its inventor.

CURCULION'IDÆ. A large family of rhynchophorous beetles. *See* WEEVIL.

CUR'CUMA. A genus of plants of the ginger family, of which *C. longa* yields turmeric, *C. Zedoaria*, zedoary.

CUREPIPE (kür-pēp). The second largest town of Mauritius, situated in the interior, at the height of 1850 feet, and reached from the capital, Port Louis, by railway. Many families spend the hot season here, the cold in Port Louis. Pop. 17,173.

CURETES. In mythology, the attendants of Rhea. They were supposed to have saved the infant Zeus from his father Cronus, and then to have become a sort of bodyguard of the god. Their number is sometimes given as ten, though in Greek art only three are usually represented. The ceremonies in connection with the cult of the Curetes consisted principally in performing the Pyrrhic dance, a kind of war-dance.

The ancients themselves confused the Curetes with other rather similar beings—the Corybantes and Cabeiri—and modern research has been unable to clear up the confusion.—Cf. L. R. Farnell, *Cults of the Greek States*.

CUR'FEW (Fr. *couvre-feu*, cover fire), A practice originated in England by William the Conqueror, who

Curfew for covering fire

directed that at the ringing of the bell at eight o'clock all fires and lights should be extinguished. The law was repealed by Henry I. in 1100, but the bell continued to be rung in many districts until quite modern times. The name was also given formerly to a domestic utensil for covering up a fire. In 1848 the curfew was still rung at Hastings, Sussex, from Michaelmas to Lady-Day.

CU'RIA. Anciently one of the thirty divisions of the Roman people, which Romulus is said to have established; also the place of assembly for each of these divisions. The *comitia curiata* was the assembly of the people in curiæ. *See* COMITIA.—Cf. G. W. Botsford, *Roman Assemblies*.

CURIA, Papal. In its stricter sense, the authorities who administer the Papal primacy; in its common wider use, all the authorities and functionaries forming the Papal court. The different branches of the curia having respect to Church government are the sacred college of cardinals, the secretariat of state, and the vicariate of Rome, the machinery employed being supplied by the chancery, the *dataria*, and the camera apostolica. As "supreme judge" in Christendom the Pope acts through special congregations and delegated judges, or through the regular tribunals of the rota and *segnatura*, and the penitenziaria.

The institution of the Papal chapel and the household of the Pope (*Famiglia Pontificia*) are also classed as departments of the curia; and finally the functionaries maintaining the external relations of the Pope—legates, nuncios, and apostolic delegates. Formerly the curia included besides these the mechanism and functions of secular administration.

CURIA REGIS, or **KING'S COURT.** The ancient supreme court of judicature of England, known also as the *Aula Regia*, or Royal Hall, instituted by William the Conqueror.

CURICO'. A town of Chile, capital of province of same name. Pop. 19,094. The province was formerly the central province of Chile, but since 1927 has formed part of Talca.

CURIE, Pierre. French scientist. Born in Paris, May 15, 1859, he was educated at the Sorbonne. He became Professor of Physics there, and in 1895 married a Polish lady, Marie Skladowska, who assisted him in his researches and was associated with him in the discovery of radium (1898). From that time they devoted themselves to the study of radium and its properties, and in 1903 were awarded, jointly with Henri Becquerel, the Nobel Prize for Physics. M. Curie was interested also in electricity, and with his brother, who was Professor of Mineralogy at Montpelier, did valuable work in this field. He was accidentally killed in Paris, April 19, 1906.

Mme. Curie succeeded her husband as Professor at the Sorbonne. In 1910 she was awarded the Albert Medal of the Royal Society of Arts, and in 1911 the Nobel Prize for Chemistry. In 1919 she became Professor of Radiology at Warsaw, where a radium hospital was established in her honour. In 1921 she was presented with a gramme of radium by the women of the U.S.A., and in 1929 American citizens gifted $50,000 to purchase radium for her work in Warsaw. Many prizes and

honours were bestowed on her own and other countries.

Her publications include: *Recherches sur les propriétés magnétiques*

Madame Curie

des aciers trempés; *Traité de Radioactivité*: *Recherches sur les substances radioactives*; *l'Isotopie et les éléments isotopes.*

CURITY'BA, or CURITIBA. A town of S. Brazil, capital of the state of Paraná, connected by railway with the port of Paranagua. Pop. 100,000.

CURLEW. A very widely distributed genus of birds, belonging to the same family (Charadriidæ) as plovers, snipe, and woodcock. The genus is characterized by a very long, slender, and arcuated bill, tall and partly naked legs, and a short somewhat rounded tail. The bill is more or less covered with a soft sensitive skin by which the bird is enabled to detect its food in the mud.

Two species of curlew inhabit the British Isles, the curlew proper, called in Scotland the "whaup" (*Numenius arquāta*), and the whimbrel (*N. phæŏpus*). They are similar in appearance and in habits, only the latter is rather smaller than the former, being about 17 inches long, while the curlew is about 2 feet. The plumage is generally dull, being greyish-brown, rusty-white, and bleckish, in both sexes, which are similar in size. They feed on various worms, small fishes, insects, and molluscous animals, and are very shy, wary birds.

Three species of curlew are inhabitants of America—the long-billed curlew (*N. longirostris*), about 29 inches long, with a bill 7 to 9 inches in length; the Hudsonian, or short-billed curlew (*N. hudsonicus*); and the Eskimo curlew (*N. borealis*).—Cf. E. Selous, *Bird Watching.*

CURLING. A winter sport which is said to have originated in the Netherlands, but has been known and popular in Scotland for at least three centuries. It has now spread to England, and is largely followed in Canada. It is played with large circular, partly flattened *curling-stones* of highly polished whinstone or granite, shaped somewhat like a Gouda cheese, weighing between 35 and 50 lb., and furnished with a handle on the upper side, by means of which they can be grasped and slid along the *rink*. This rink is a stretch of ice varying in length from 30 to 50 yards. Climate permitting, it may be on a frozen river or lake; in Britain a shallow pond, often artificial, is more often used. At each end of the rink is a mark or hole called the *tee*.

The players form two parties, each one headed by a "skip" or captain, who directs his party's play. The number of players on each side is four or eight; four when each player uses two stones, eight when one stone only is employed. The object of each player is to lay his stone as near the tee as possible, to guard such stones of his own side as have already been well laid, or to displace well-laid stones of the opposing side. When the stones on both sides have all been played, the stone lying nearest the tee counts one, and if the second, third, fourth, etc., belong to the same side, each counts one more. "Game" is usually twenty-one, or sometimes thirty-one.

If a player's stone does not cross a line, called the *hog-score*, drawn at some distance in front of the tee, his shot goes for nothing, and his stone is removed from the rink. Subject to certain regulations, sweeping the ice with besoms before a running stone is permitted. It will be seen from the above description that the game much resembles that of bowls. In Scotland set matches, called *bonspiels*, excite great enthusiasm, and are often made the occasion of hearty good fellowship and conviviality.—

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CURR'AGH, The. A plain or common in Ireland, County Kildare, the property of the Crown and the site of the chief military encampment in Ireland, formed in 1855, and having accommodation for 12,000 troops. The Curragh is also famous for its racecourse. The races are held in April, June, September, and October.

CUR'RAN, John Philpot. Irish advocate and politician, born at Newmarket, near Cork, in 1750. He was educated at Trinity College, Dublin, went to London, was called to the Bar, and during the administration of the Duke of Portland became King's Counsel. In 1784 he was chosen a member of the Irish House of Commons. His eloquence, wit, and ability soon made him the most popular advocate of his age and country. On a change of ministry during the vice-royalty of the Duke of Bedford his patriotism was rewarded with the office of Master of the Rolls, which he held till 1814, when he retired with a pension of £3000 a year. He died at Brompton in 1817. Collections of his forensic speeches were published in 1805, 1808, 1845, and a *Life of Curran* by his son in 1819.

CURRANT (from Corinth, being brought from the adjoining parts of Greece). (1) A small kind of dried grape imported from the Levant, chiefly from the vicinity of Patras in the Morea, as also from Zante, Cephalonia, and Ithaca, of which islands they are the staple produce. The plant is delicate and the crop precarious, and as the plantation must be six or seven years old before it bears, its cultivation requires a great outlay of capital. After being dried, the currants are exported in large butts.

(2) The name of two well-known shrubs, ord. Grossulariaceæ, cultivated in gardens for their fruit. The red currant, *Ribes rubrum*, the fruit of which is used principally for tarts and jellies, is a native of S. Europe, Asia, and North America. The white currant is a cultivated variety of the red, and is used chiefly for dessert and for conversion into wine. The black currant, *R. nigrum*, a native to most parts of Europe, and found abundantly in Russia and Siberia, is used for tarts and puddings and for a fine jelly recommended in cases of sore throat. Other currants naturalized in Britain are the ornamental *Ribes aurĕum* from Western America, which produces a fine berry, and *R. sanguinĕum*, the flowering currant, which is insipid but non-poisonous.

Many species are indigenous in America. In Australia the name is given to *Leucopōgon Richei*, one of the Epacridaceæ, and in Tasmania to certain species of Coprosma, of the nat. ord. Rubiaceæ. The Indian currant of America is the snow-berry. *Symphoricarpus racemōsus.*

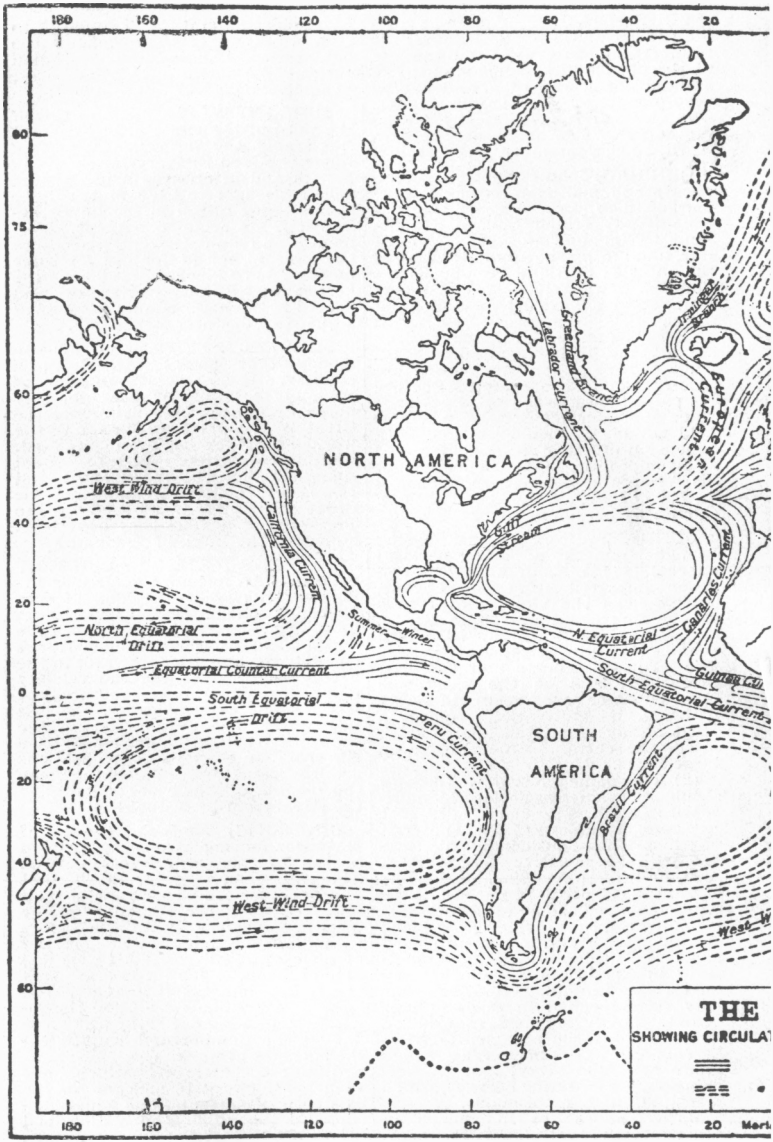
CURRANT WINE. A wine made of the juice of the white or red currant (preferably the former). A pint of water is added to every four pints of berries and afterwards a pound and a half of sugar to each pint, a little spirits being mixed in the liquor before it is set aside to ferment. Fermentation requires several weeks, and the wine is not fit for use for some months. For black-currant wine the berries are first put over the fire and heated to the boiling-point in as small a quantity of water as possible.

CURRENCY. Term used for the money that passes current in a country. It may consist of coins of gold, silver, bronze or nickel, or may be paper money, of which, since the Great War, a great proportion of the world's currency has been composed. The name currency notes is used sometimes for the notes of £1 and 10s. issued in Great Britain since the Great War. At first issued by the Treasury, since 1928 they have been issued by the Bank of England.

CURRENT METER, or **CURRENT GAUGE.** An instrument for measuring the velocity of currents. It may be constructed in various ways. It may, e.g., be simply a bent tube which has its lower end open to the current, the acsension of water in the vertical part indicating the velocity of the current. A more elaborate type is the screw current meter. In this instrument a screw, similar to the screw of a ship, is driven by the current. On the axis of the screw is a worm which drives a counter, from the reading of which the velocity of the stream can be deduced.

CURRENTS, Marine. Masses of sea-water flowing or moving forward in the manner of a great stream. They are phenomena of the highest importance, both on account of their influence upon the climate of many maritime regions—an influence often extending far inland—and because of their practical relation to the art of navigation. Such currents are very numerous, and, taken together, constitute an oceanic circulation the intricacy and irregularity of which are due to the number and varieties of the agencies at work.

Amongst the theories which have been put forward to account for the existence of currents, one widely accepted is that of a circuit maintained between equatorial and polar waters. According to this view, there is in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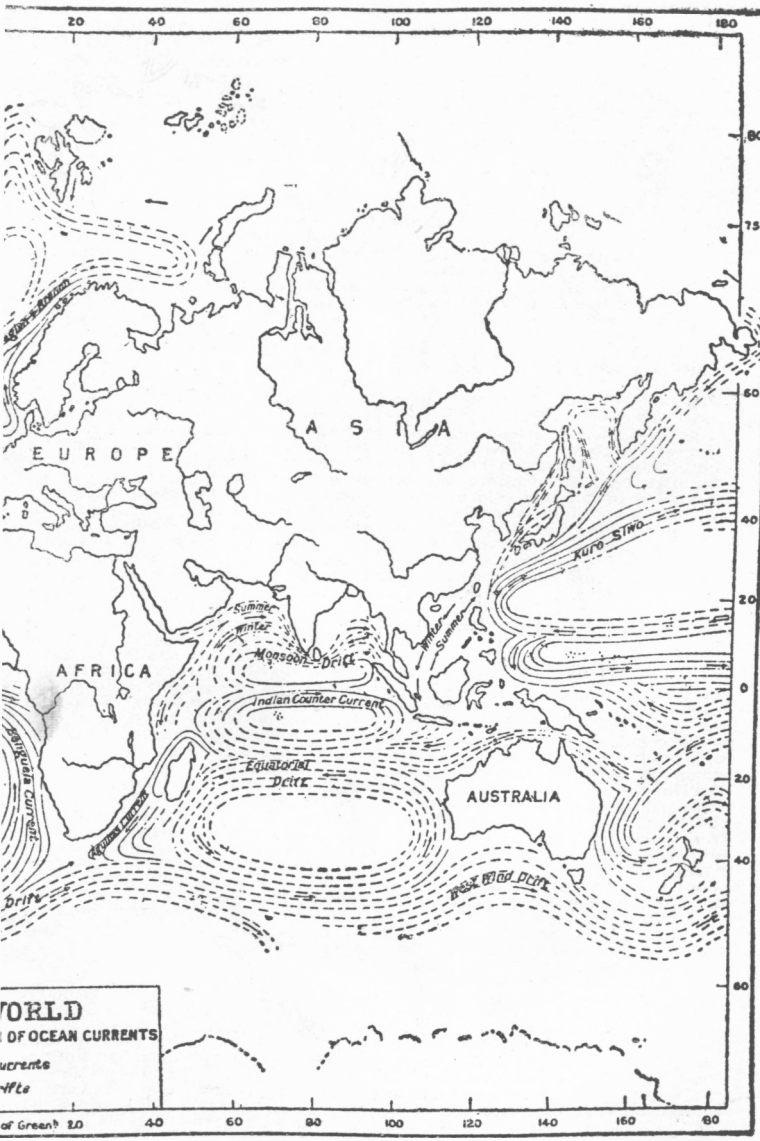

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either hemisphere an area within which the waters of the ocean are colder, and consequently by many degrees denser, than within the belt of the tropics. The natural result is a tendency of the colder and heavier water to sink and to diffuse itself over the lower portion of the ocean-bed, and a movement of the warmer and lighter water in the direction of the surface, over which it tends to become diffused. In other words, the colder waters will move beneath the surface in the direction of the equator, and the warmer waters will flow along the surface in the direction of either pole. Hence, in either half of the globe, there are two great and opposite currents — a *cold* current flowing from the pole towards the equator, and a *warm* current flowing from the equator in the direction of the pole.

This theory has been well illustrated by Dr. Carpenter's experiment, in which a trough of glass, filled with water and having a lump of ice at one end and a heated bar of iron at the other, exhibits a similar circulation of hot and cold currents. To this theory Sir C. Wyville Thomson opposed that of evaporation as the general cause of the movement, holding that, at least in the Antarctic Ocean, the return of moisture to the south to balance the cold indraught of water that comes thence takes place in a great measure through the atmosphere.

Another great general cause of currents is to be found in the axial rotation of the earth eastward, by which the movement of tropical waters in the direction of the pole is deflected eastward. This deflection produces in the northern hemisphere a north-eastwardly current, and in the southern a south-eastwardly one. Under the operation of the same laws the opposite currents from polar latitudes to the equator are deflected in south-westerly and north-westerly directions respectively. It is to such influences that may in the main be attributed the well-known differences between the climates of North America and Europe within corresponding parallels.

Other causes, more local in their nature, must be sought for to explain the origin of currents in particular cases. In the case of surface or drift currents, for instance, it is probable that these are largely due to the action of winds. Thus it is the constant drift of surface water to the westward under the influence of the trade-wind that produces the equatorial currents of the Atlantic and Pacific.

In the case of the Atlantic Ocean the westward-moving waters, encountering the eastward extension of the South American mainland, necessarily become divided into two streams; one sets to the southward along the eastern coast of Brazil, while the other advances along the more northerly portions of the South American continent, passes the outlets of the Amazon and the Orinoco, and reaches the Caribbean Sea. From the latter land-enclosed basin its course is necessarily into the similarly shut-in waters of the Mexican Gulf, whence it finally emerges through the narrow channel of Florida as the well-known Gulf Stream (q.v.).

In the case of the Pacific Ocean there exists no such unbroken land barrier to the westwardly progress of the equatorial waters. A portion of the equatorial stream is, however, deflected to the northward towards the coasts of Japan (where it forms the well-known Japan Stream, setting to the north-eastward, past the Kuriles, in the direction of the Aleutian Islands); while another portion turns southward in the direction of Australia and New Zealand. To the same action of the winds, operating in connection with the obstacles presented by the land, are due divergent and counter-currents. Thus in the Atlantic and the Pacific there flows between the two equatorial trade-wind currents a counter-current moving in exactly the opposite direction, while a similar counter-current exists in the Indian Ocean north of its sole trade-wind current.

Indraught Currents are caused by the flow of water to replace that taken away by currents due to causes already mentioned. An example of this is found on the west coast of Africa, where an indraught current replaces the water blown towards the coast of South America. In the case of inland seas evaporation determines the direction of the surface currents, the direction being *inwards* where, as in the Mediterranean, the evaporation exceeds the influx of fresh water, and *outwards*, as in the Baltic and Black Seas, where the opposite is the case. *See* ATLANTIC OCEAN.

CURRIE, Sir Arthur William. Canadian soldier. Born in Ontario, 5th Dec., 1875, he became an estate agent at Victoria, British Columbia. As an officer in the Canadian militia, he commanded a brigade in Europe in 1915, fighting at Ypres in April of that year. Later he was appointed to a division. In 1917 he became Commander of the Canadian Corps, which he led to the end of the war.

Knighted in 1917, in 1919 he was made Inspector-General of the Canadian Forces, and in 1920 Principal of M'Gill University, Montreal.

CURRIE, Sir Donald. Scottish shipowner. Born in Greenock, 17th Sept., 1825, he became a clerk in a shipping firm there. In 1868 he started in business himself, and soon had boats sailing to and from S. Africa. He called his firm the Castle Line, and later the Union Castle Line, all the ships being named after castles. In 1877, Currie was knighted, and in 1880 he became a Liberal M.P. He remained in Parliament until 1900, but separated himself from Gladstone, a personal friend, on the home rule question. He died 13th April, 1909.

CURRIE, James, M.D. The biographer of Burns and earliest editor of his works, was born in Dumfriesshire in 1756, died in 1805. He tried in succession commerce, journalism, and medicine, and in 1780, after completing his studies at Edinburgh, was appointed assistant-surgeon in the army. Disappointed in his hopes of promotion, he settled at Liverpool, where he was made a physician to the infirmary, and increased his reputation by some publications on medicine, such as *Reports on the Effects of Water in Fever and Febrile Diseases*.

He is, however, best known for his edition of Burns. Having made an excursion into Scotland in 1792, he had become personally acquainted with Robert Burns, and upon the death of the poet he was induced to become the editor of his works, to which he added a *Life*. By this work, long regarded as the standard edition, a sum of £1400 was raised for Burns's wife and her family.

CURRYING. *See* TANNING AND CURRYING.

CURSE OF SCOTLAND. A term given to the nine of diamonds in a pack of cards, on account, it is supposed, of the pips having a resemblance to the heraldic bearings of the Earl of Stair, who was detested for his share in the massacre of Glencoe. Another explanation of the term is the following: The Duke of Cumberland, while drunk and gambling on the night before the battle of Culloden, is supposed to have written across the face of this card the order that no quarter was to be given on the morrow.

CURSO'RES. Running birds of the ostrich kind. *See* RATITÆ.

CURTAL-AX. A form of the Fr. *coutelas*, properly a short sword, but used as if meaning a kind of axe.

CURTA'NA. The pointless sword carried before the kings of England at their coronation, and emblematically considered as the sword of mercy. It is also called the sword of Edward the Confessor. It is also the name given to the sword of Ogier the Dane and to that of Roland.

CURTILAGE. A term appearing in various Acts of Parliament but nowhere expressly defined. It is applied to a courtyard or plot of ground adjacent and appertaining to a dwelling-house. It does not include a garden or orchard, but generally may be any other ground which would pass as a part and pertinent under a conveyance of a house.

CURTESY. In English and Scots law, the life interest of a husband on his wife's lands after her decease. It becomes consummated only after the wife's decease, and if, except with gavelkind lands, there has been issue competent to inherit. In cases of intestacy the right was unaffected by the Married Women's Property Act, 1882. Similar rules of law exist in France and Germany; some of the United States recognise in their own laws tenancy by the curtesy of England.

CURTIUS, Ernst. A German Hellenist, born 1814, died 1896. He visited Greece in 1837 (as also subsequently) to make antiquarian researches, and became tutor to the Emperor Frederick, whom he accompanied to Bonn. In 1856 he succeeded Hermann as professor at Göttingen, and in 1868 was called to Berlin University. Of his works, which all relate to Greek antiquities, the best known is his *History of Greece*; English translation by Sir A. W. Ward (1868-73).

CURTIUS, Georg. Brother of the preceding, a distinguished philologist, notable for his application of the comparative method to the study of the Greek and Latin languages. He was born at Lübeck in 1820, and in 1862 became professor of classical philology at Leipzig. He died in 1885. Of his works a *Greek Grammar*, *Principles of Greek Etymology*, and *The Greek Verb* have been translated into English.

CURTIUS, Mettus or Marcus. A noble Roman, who, according to the legend, plunged with horse and armour into a chasm which had opened in the forum (362 B.C.), thus devoting himself to death for the good of his country, a sooth-sayer having declared that the dangerous chasm would only close if what was most precious to Rome was thrown into it.

CURTIUS RUFUS, Quintus. A Roman writer, author of *De rebus gestis Alexandri Magni* (History of Alexander the Great), in 10 books, the two first of which are lost. His style is florid, and his narratives have more of romance than of historical certainty. Nothing is known of his life.

CU'RULE MAGISTRATES. In ancient Rome, the highest dignitaries of the State, distinguished from all others by enjoying the privilege of sitting on ivory chairs (*sellæ curules*) when engaged in their public functions. The curule magistrates were the consuls, prætors, censors, and chief ædiles, who, to distinguish them from the plebeian ædiles, were called *curule*.

CURVE AND CURVATURE. A *curve* is the locus, or assemblage of positions, of a point which moves in such a way as always to fulfil a given condition. The expression of this condition in terms of the co-ordinates of the moving point leads to an equation which is called the *equation of the curve*. If the equation of a curve involves only powers of x and y, the curve is said to be *algebraic*; if other functions are involved, the curve is called *transcendental*. It is sometimes convenient to regard a curve as the trace of a moving point whose direction of motion is continually changing, or again, as the limit of a polygon whose sides become indefinitely small.

The **curvature** at a point of a curve is the rate of change of direction of the tangent per unit length of arc. The *circle of curvature* at the point is the circle which touches the curve there, and has the same curvature. The radius of the circle of curvature is called the *radius of curvature*. A curve which does not lie in one plane is said to be *twisted*, or to have *double curvature*.—BIBLIOGRAPHY: G. A. Gibson, *Elementary Treatise on the Calculus*; G. Salmon, *Treatise on the Higher Plane Curves*.

CURWEN, John. English musician. The chief promoter of the tonic sol-fa method of teaching to sing; was born 14th Nov., 1816, died 26th May, 1880. He entered the ministry of the Independent Church, and became acquainted with Miss Glover's *sol-fa* system while visiting that lady's schools at Norwich. After that he devoted much of his time to bringing the new method before the public by lectures, publications, and the establishment of a tonic *sol-fa* association and college. He also brought out a periodical called the *Tonic Sol-fa Reporter*.

CUR'ZOLA. The most beautiful of the Dalmatian islands, in the Adriatic, stretching W. to E. about 25 miles, with an average breadth of 4 miles; area, 100 sq. miles. It is covered in many places with magnificent timber. The fisheries are very productive. The island came under Austrian rule in 1815, but since 1918 it belongs to Yugoslavia. It contains a small town of the same name. Pop. 28,365.

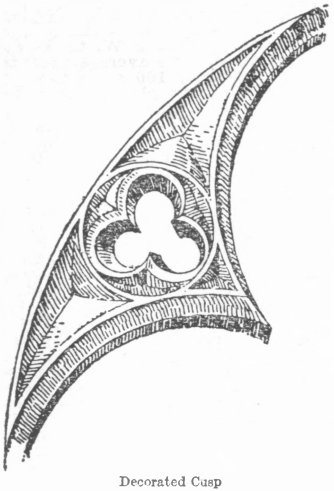
CURZON OF KEDLESTON, George Nathaniel Curzon. First Marquess. British politician and traveller, son of Baron Scarsdale, born in 1859. He was educated at Eton and Balliol College, Oxford, became assistant private secretary to the Marquess of Salisbury in 1885, and from 1886 to 1898 was member of Parliament for the Southport division of Lancashire. He has been Under Secretary for India and for Foreign Affairs; and from 1898 to 1905 was Viceroy of India, a post which he occupied with high distinction, and for which he was partly prepared through his extensive travels in Asia.

On being appointed Viceroy he was created a member of the Irish peerage, and in 1908 he joined the House of Lords as an Irish representative peer. His resignation of the viceroyship was partly brought about by his views conflicting with those of Lord Kitchener, the head of the Indian army. He was Lord Warden of the Cinque Ports from 1904 to 1905, during his temporary absence from India. In 1915 Lord Curzon joined the Coalition ministry, was Lord Privy Seal from 1915 to 1916, President of the Air Board in 1916, Lord President of the Council 1916 to 1919, and became Secretary of State for Foreign Affairs in Oct., 1919.

He has written: *Russia in Central Asia and the Anglo-Russian Question*; *Persia and the Persian Question*; *Problems of the Far East: Japan, Korea, China*; *Modern Parliamentary Eloquence*; *Subjects of the Day*. He died in 1925.

CUSA, Nikolas of, or **NIKOLAUS CUSANUS.** Roman Catholic philosopher and theologian, born 1401, died 1464. As Archbishop of Liège he attended the Council of Basel (1431-49), where he opposed the Papal claims, but he afterwards entered the Papal service, and was made a cardinal in 1448. He taught that God cannot be apprehended by intellect, but by intuition. He was the first to teach the revolution of the earth about the sun and the plurality of worlds.

CUSCO-BARK, or **CUZCO-BARK.** The bark of *Cinchona pubescens*, which



Decorated Cusp
At Piddington, Oxfordshire, 1300.

comes from Cuzco, in S. America, and is exported from Arequipa. It contains a peculiar alkaloid called cusco-cinchonine, or cusconine, which resembles cinchonine in its physical qualities, but differs from it in its chemical properties. When applied medicinally it excites warmth in the system, and is therefore recommended to be given in cold intermittents and low typhoid states of the system.

CUSCUS. *See* PHALANGER.

CUS'CUTA. *See* DODDER.

CUSH. The eldest son of Ham. It is also the name of a country frequently mentioned in the Old Testament, probably in Africa, south of Egypt. In other places it is evident that the name Cush must also be understood as referring to some part of Arabia.

CUSHEW, or **CASHEW'-BIRD.** *See* CURASSOW.

CUSHION-CAPITAL. A capital which has the appearance of a cushion pressed upon by the weight of its entablature, or, like the Norman capital, consisting of a cube rounded off at its lower extremities.

CUSP (Lat. cuspis, point, spear). In geometry, a point on a curve at which two branches have the same tangent. Such points are numerous in architecture in the internal curvings of trefoils and heads of Gothic windows. In the Decorated and Perpendicular styles the cusps were frequently ornamented with heads of animals as well as with leaves and flowers. In the Romanesque and Norman styles they were often ornamented with a small cylinder which bore a flower or similar design.

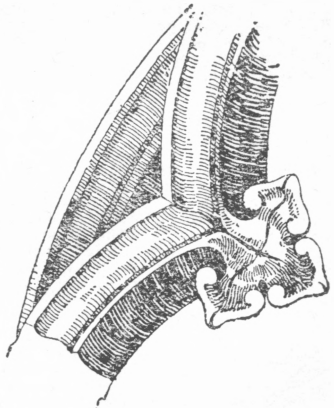
CUSSO (*Brayera anthelmintica*). A small Abyssinian tree, ord. Rosaceæ, yielding flowers which are imported into Europe and used as an anthelmintic.

CUS'TARD-APPLE (*Anōna reticulāta*), a delicious fruit, a native of the West Indies, but cultivated in most tropical countries. The fruit is large, and heart-shaped, with a thick, rough exterior, and containing a pulp of a sweet flavour, very cooling and agreeable. To the same genus belong the alligator-apple, sour-sop, sweet-sop, and cherimoyer.

CUSTO'DIA. A shrine of precious metal in the shape of a cathedral, in which the host or the relics of a saint are carried in procession on certain solemn occasions.

CUSTOMARY FREEHOLD. *See* COPYHOLD.

CUSTOMARY LAW. That part of the common law which has its origin in local custom. (*See* COMMON LAW.) Custom is "a reasonable act iterated, multiplied, and continued by the people from time whereof memory runs not." It has been defined in law as "usage which hath obtained the force of law and which is in truth a binding law for the particular place, persons, and things concerned." At what particular stage custom assumes



Decorated Cusp
Lincoln Cathedral, 1380.

the character of law is a disputed point among the authorities on jurisprudence. Austin holds that it does not do so until it has received the imprimatur of the legislature or judiciary. Holland, on the other hand, maintains that the legislative or judicial recognition is merely declaratory—the acknowledgment by the State of a law already in existence to which it must give effect.

More important is it to consider the conditions precedent to such recognition. To obtain it a custom must be certain; reasonable—not opposed to the public weal or prejudicial to the many or beneficial only to one or based upon wrong; ancient—practised from time immemorial or at least well established; not optional in observance; continuously exercised as of right and universally acquiesced in; not inconsistent with another custom of the same place nor with legal principles. In any conflict statute law is superior to custom, but through the force of contrary custom a Scots statute might fall into desuetude. There is no parallel to this in England.—Cf. Pollock and Maitland, *History of English Law*.

CUSTOMS. Duties charged upon goods exported from or imported into a state. Customs in the United Kingdom almost entirely consist of taxes or duties charged on the importation for consumption of foreign and colonial merchandise, but exported coal was also charged from 1901 to 1906. The Excise Department was formerly under the Inland Revenue Department, but was amalgamated with the Customs Department on 1st April, 1909. At the end of the sixteenth century the customs revenue was £50,000; towards the end of the seventeenth, £781,987; in 1907-8, £32,582,000; in 1919-20, £149,360,000; and in 1931-2, £136,152,000.

In 1932 and 1933 the revenue from customs duties greatly increased owing to the general imposition of tariffs, but tobacco, tea, spirits, sugar, and wine still furnish the major part of the whole customs revenue. In most other countries customs duties are levied on most articles of import, and largely for protective purposes. Other countries have a modified form of protection. *See* TAXATION.

CUSTOS ROTULO'RUM. The chief civil officer or Lord-Lieutenant of an English county, who has the custody of the rolls and records of the sessions of the peace. He is usually a nobleman, and always a justice of the peace of the quorum in the county where he is appointed. The offices was formerly filled by appointment of the Lord Chancellor, but it has been conferred by the Crown for over 300 years.

CUTCH. *See* CATECHU.

CUTCH. A state in the west of India, lying to the south of Sind, under British protection; area, 7616 sq. miles. During the rainy season it is wholly insulated by water, the vast salt morass of the Runn separating it on the north and east from Sind and the Guicowar's Dominions. Its southern side is formed by the Gulf of Cutch, and on the west it has the Arabian Sea. The country is subject to violent volcanic action. The date is the only fruit which thrives, and the principal exports are cotton and horses.

The Runn of Cutch (or Rann of Kach) covers about 9000 sq. miles, and is dry during the greater part of the year. Pop. of state (1891), 558,415; 1901 (reduced by famine), 487,384; 1911, 513,429; 1931, 513,829.

CUTCH GUNDA'VA. A division of Baluchistan, in the north-east; area, 10,000 sq. miles; pop. 100,000.

CUTHA, or KUTHA. An ancient city in Babylonia, identified with the present Tell Ibrahim, 25 miles N.E. of Babylon. Men from Cutha were carried away to Samaria (2 Kings xvii. 24), where they continued to worship Nergal, and the Samaritans were, therefore, often spoken of as Cuthæans.

CUTH'BERT, St. Celebrated Father of the early English Church, was born, according to the tradition, near Melrose about 635. He became a monk, and in 664 was appointed prior of Melrose, which after some years he quitted to take a similar charge in the monastery of Lindisfarne. Still seeking a more ascetic life, Cuthbert then retired to the desolate isle of Farne. Here the fame of his holiness attracted many great visitors, and he was at last persuaded to accept the bishopric of Hexham, which he, however, resigned two years after, again retiring to his hermitage in the island of Farne, where he died in 687. The anniversary of his death was a great festival in the English Church.—Cf. C. Eyre, *The History of St. Cuthbert*.

CU'TICLE (Lat. *cuticula*, dim. of *cutis*, skin), the epidermis or outermost layer of the skin, a thin, tough membrane that covers and defends the true skin. For cuticle of plants, *see* EPIDERMIS.

CU'TIS. In anatomy, a dense resisting membrane, of a flexible and extensible nature, which forms the general envelope of the body; it is next below the cuticle, and is often called the true skin.

CUT'LASS (Lat. *cultellus*, dim. of *culter*, knife). A short sword used by seamen. It usually has a guard over the hand. It is a very effectual weapon in hand-to-hand fighting; on account of its shortness it can be handled easily, and yet is long enough to protect a skilful swordsman.

CUTLERIA. A genus of Brown Algæ, forming with Zanardinia the small family Cutleriaceæ. *C. multifida* has an upright, flattened thin, much-divided thallus, each branch ending in a double fringe of hairs, at the base of which cell-division and growth take place ("trichothallic growth"). Both male and female gametes are motile, but the female are much the larger, and come to rest before being fertilized. Asexual zoospores are produced on separate individuals, which differ so much in form from the sexual plants that they were long regarded as belonging to a distinct genus, Aglaozonia.

CUT'LERY. A term applied to all cutting instruments made of steel. The finer articles, such as the best scissors, penknives, razors, and lancets, are made of cast-steel. Table-knives, plane-irons, and chisels of a very superior kind are made of shear-steel, while common steel is wrought up into ordinary cutlery. One of the commonest articles of cutlery, a common razor, is made as follows: The workman, being furnished with a bar of cast-steel, forges his blade from it. After being brought into true shape by filing, the blade is exposed to a cherry-red heat and instantly quenched in cold water. The blade is then tempered by first brightening one side and then heating it over a fire free from flame and smoke, until the bright surface acquires a straw colour. It is again quenched, and is then ready for being ground and polished.—Cf. G. T. H. Lloyd, *The Cutlery Trades*.

CUTTACK. A town of India, in Orissa, on the right bank of the Mahanuddy, 60 miles from its embouchure and 230 miles S.S.W. of Calcutta. It has little trade, and is known mainly for its beautiful filigree work in gold and silver. Pop. 51,007.

The district of **Cuttack** has an area of 3654 sq. miles. It is well watered, and rice, pulse, sugar, spices, dyestuffs, etc., are grown along the coast, which is low and marshy, and wheat and maize in the hilly regions. On the coast salt is extensively manufactured. Pop. 2,059,000.

CUTTER. A small vessel resembling a sloop, with one mast, and a straight running (not fixed) bowsprit, the sails being usually a fore-and-aft mainsail, gaff topsail, stay foresail, and jib.

A **revenue cutter** was a light, armed vessel, commissioned by the Government to prevent smuggling and to enforce customs regulations.

CUTTINGS. Twigs, shoots, or other parts cut from plants and inserted in soil so that they may take root and become perfect plants of the same kind as those from which they are cut. The root that a cutting acquires when planted is commonly from a developed bud, and the cutting selected has generally a bud near its base; but there are plants that may be readily propagated from a leaf or part of a leaf. Many trees, shrubs, and herbaceous plants are readily propagated by cuttings—for instance, willows, gooseberries, pinks, geraniums—but others take root or strike less easily, and in general a specially prepared soil is advisable, though many plants will strike in common garden soil.

The soil most commonly employed is silver sand, alone or mixed with earth; and brick-dust, powdered charcoal, burned clay, and other substances are also employed to encourage the rooting of the cuttings; while certain conditions of temperature, moisture, light and shade, and shelter must be attended to.

CUTTLE-BONE. The dorsal plate of *Sepia officinālis*, formerly much used in medicine as an absorbent, but now used for polishing wood, painting, and varnishing, as also for pounce and tooth-powder.

CUTTLE-FISH. *See* CEPHALOPODA; SQUID; and SEPIA.

CUTTY-STOOL (Scot. *cuttie*, short). A low stool, the stool of repentance, a seat formerly set apart in Presbyterian churches in Scotland, on which adulterers were exhibited before the congregation and submitted to the minister's rebukes before they were readmitted to Church privileges.

CUT-WORM. An American name for any worm, caterpillar, or grub which is destructive to cultivated plants, as cabbage, corn, beans, and young cotton. It can be killed by spreading about cabbage leaves poisoned with Paris green.

CUVIER (küv-yā), **Georges Leopold Chrétien Frédéric Dagobert, Baron.** Distinguished French naturalist, born 23rd Aug., 1769, at Montbéliard, then belonging to the duchy of Würtemberg, died at Paris 13th May, 1832. After studying at Stuttgart, he became a private tutor in the family of Comte d'Héricy, in Normandy, where he was at liberty to devote his leisure to natural science, and in particular to zoology.

A natural classification of the Vermes or worms was his first labour. The ability and knowledge shown in this work procured him the friendship of the greatest naturalists of France. He was invited to Paris, established at the Central School there, and received by the Institute as a member of the first class. His lectures on natural history were distinguished not less for the elegance of their style than for profound knowledge and elevated speculation. In Jan., 1800, he was appointed to the Collège de France. Under Napoleon, who fully recognized his merits, Cuvier held important offices in the Department of Public Instruction. In 1819 he was received amongst the forty members of the French Academy. In 1831 he was raised to the rank of peer of France, and was subsequently appointed President of the Council of State.

Amongst the numerous works by which he greatly extended the study of natural history we may mention: *Recherches sur les Ossemens Fossiles*; *Discours sur les Révolutions de la Surface du Globe*; *Leçons d'Anatomie Comparée*; *Histoire Naturelle des Poissons*; *Le Règne Animal*, a general view of the animal kingdom, in which all animals were divided into the four great classes: Vertebrata, Mollusca, Articulata, and Radiata. His brother Frédéric (1773-1838) was also a naturalist of no mean order.—BIBLIOGRAPHY: S. Lee, *Memoirs of Baron Cuvier*; P. J. M. Flourens, *Histoire des travaux de Georges Cuvier*.

CUX'HAVEN. A German seaport, bathing-place, and pilot station in Hamburg territory, at the mouth of the River Elbe. The harbour is large and commodious, and there are shipyards, a lighthouse, an old castle, and fortifications. Cuxhaven was one of the minor German naval bases during the European War. It was raided by British war vessels in Dec., 1914. Pop. 17,648.

CUYABÁ (kö-yá-bā'), or **JESUS DE CUYABÁ.** A town of Brazil, capital of Matto Grosso, on the River Cuyabá, nearly 300 miles above its entrance into Paraguay. Pop. 41,000. There are rich gold-mines in the district.

CUYP (koip), **Albert.** *See* KUYP.

CUZCO or **CUSCO.** An ancient city in Peru, capital of a department of the same name, is situated in a wide valley about 11,300 feet above sea-level, between the Apurimac and Urubamba. The houses are built of stone, covered with red tiles, and are many of them of the era of the Incas. The ruins of the fortress built by the Incas, a stupendous specimen of cyclopean architecture, are still to be seen, as well as other massive specimens of ancient Peruvian architecture. The inhabitants manufacture sugar, soap, cotton, and woollen goods.

Cuzco is the most ancient of the Peruvian cities, and was at one time the capital of the Empire of the Incas. In 1534 it was taken by Pizarro. Pop. 15,000. Area of the department, 55,716 sq. miles; pop. est. 700,000.

CY'AMUS. A genus of Crustacea, the species of which are parasites on the whale. They are called *Whalelice*.

CYANAMIDE, or **CALCIUM CYANAMIDE.** Produced by heating calcium carbide to 1000° C. in an atmosphere of nitrogen, or by heating a mixture of limestone and charcoal to 2000° C. in a current of air. This yields crude calcium cyanamide, which is used as a fertilizer in agriculture. The compound contains nitrogen, and is readily decomposed by water, yielding ammonia, which may be utilized by the plant.

CY'ANIDES. Compounds of the radicle cyanogen. Carbon and nitrogen combine indirectly to form cyanogen, C_2N_2, and this group behaves as an element, entering unchanged into the composition of a large number of compounds.

The simplest derivative is hydrocyanic acid, hydrogen cyanide, or prussic acid, and the simple salts of this acid comprise the simple cyanides.

Cyanogen is prepared by decomposing mercuric cyanide at a dull-red heat, the gas being collected over mercury. It polymerizes easily to paracyanogen, a dark-brown solid.

Hydrogen cyanide, or prussic acid, is prepared by running a 30 per cent. solution of sodium cyanide into a small excess of 60 per cent. sulphuric acid, drying the vapour over calcium chloride at 30° C., and condensing the gas in an ice-cooled vessel. It is a colourless liquid, a weak acid, and is intensely poisonous, the fatal

dose for a man being about $\frac{1}{10}$ gram. It is miscible with water and alcohol, but insoluble in petrol.

The simple cyanides of the alkali metals, the alkaline earths, and mercury are soluble in water; all other simple cyanides are insoluble, and hence can be obtained by double decomposition from a soluble cyanide, sodium cyanide being generally used. Soluble and insoluble cyanides dissolve in excess of alkali cyanides to produce complex cyanides.

In the presence of oxygen the soluble cyanides dissolve all ordinary metals except lead and platinum, and this property is utilized in extracting gold from its ores (*see* CYANIDING).

Manufacture of Cyanides.—Sodium and potassium cyanides are the most important, and are made chiefly by the following processes:

(*a*) Ammonia is forced through a hot liquid mass of 60 per cent. potassium carbonate, 20 per cent. potassium cyanide, and 20 per cent. powdered charcoal.

(*b*) Dry ammonia is passed over sodium at 400° C. in the absence of air, forming sodamide, $NaNH_2$, which is mixed with charcoal at 600° C., producing disodium cyanamide, Na_2N_2C. This is heated with charcoal to 800° C., and combines with it, giving pure sodium cyanide.

(*c*) From *schlempe*, the waste residues of sugar-beet manufacture, by strongly heating the residue. Prussic acid is evolved, which is absorbed by alkali, and sodium cyanide crystallizes out.

Potassium and sodium cyanides are white crystalline solids which are very poisonous, and are used in electro-plating with gold, silver, copper, nickel, and tin, and in photographic work. The sodium compound is used to-day for gold extraction, the fumigation of fruit trees, and case hardening. Potassium cyanide is stable in dry air, but when fused oxidizes readily, and is a powerful reducing agent.

Other metallic cyanides are obtained from these compounds, generally by double decomposition.

Alkali ferrocyanides.—Sodium and potassium ferrocyanides are used for silk dyeing, for Prussian blue manufacture, and case hardening iron. The modern method for the production of sodium ferrocyanide is to pass the crude coal-gas of the gasworks through saturated ferrous sulphate solution, precipitating a cyanide sludge, which is boiled to give ferroammonium cyanide. This is filter-pressed, and the cake is heated with lime, forming calcium ferrocyanide. An equivalent of sodium carbonate is added, precipitating calcium carbonate, and the sodium ferrocyanide solution is evaporated and crystallized. By using potassium carbonate instead of sodium carbonate, potassium ferrocyanide, or yellow prussiate of potash, is similarly obtained.

Prussian blue is ferric ferrocyanide. It is obtained by heating crude calcium ferrocyanide or the yellow prussiate with ferric oxide solution, or by mixing yellow prussiate and ferrous sulphate solutions, and oxidizing the white precipitate with chlorine or nitric acid. The purest commercial form is known as "Paris blue," other less pure forms as "mineral blue." When a ferric salt is mixed with an excess of yellow prussiate, "Prussian blue soluble in water" is obtained, and this when mixed with indigo carmine yields "night blue," which does not change colour in artificial light. Prussian blue is now falling into disuse owing to the competition of the aniline colours and ultramarine, and also to its being fugitive to soap.

Blue printing-paper is paper coated with a solution of ferric ammonium citrate or oxalate and potassium ferricyanide, and is exposed to light beneath a transparent drawing. The light reduces the salt to the ferrous state, and on washing in water a deposit of Prussian blue is obtained, and the unexposed portions emerge white.

Alkali ferricyanides are used in pigment manufacture, in dyeing, and in printing. They are obtained by chlorine or electrolytic oxidation of the corresponding ferrocyanide. They are red compounds, the potassium compound being known as red prussiate of potash.

Turnbull's blue is ferrous ferricyanide, $Fe_3Fe_2(CN)_{12}$, and is obtained by adding red prussiate solution to a ferrous salt solution. Prussian blue contains large quantities of Turnbull's blue.

Sulphocyanides.—These compounds are almost exclusively obtained from gasworks liquors. The coal gas is passed through a water-fed tower containing lumps of sulphur, ammonium polysulphides being formed. These are decomposed by prussic acid, giving ammonium sulphocyanide, which is a very sensitive reagent for iron. Ammonium sulphocyanide may be distilled with lime, producing calcium sulphocyanide, and the ammonia is recovered. The sulphocyanide is now heated with alkali carbonate, giving the alkali sulphocyanide desired.

Nitroprusside of sodium, which is a sensitive reagent for alkali sulphides

and organic substances, is obtained by the action of nitric acid on a solution of sodium ferrocyanide.

CYANIDING. The process of extracting gold from its ores by means of sodium cyanide solution. The ore is broken and ground till it can pass a 150 to 200 mesh sieve. It is then washed with alkaline solution to overcome the action of any destructive compounds upon the cyanide solution which follows. One-third of the total weight of ore is now added as cyanide solution of about 0·1 per cent. strength, which is followed by washings of weaker cyanide and of water. Argentiferous gold ore requires a stronger cyanide solution to extract its gold.

The gold is now in solution as sodium aurocyanide, and is precipitated as a slime by thread-like turnings of zinc. The "slimes" are worked up with suitable fluxes, or with sulphuric acid, or with lead, to recover the gold in a pure form. The solution of aurocyanide may also be electrolysed when the gold is deposited on the cathode, which is then cupelled.

In practice about 14 oz. of sodium cyanide and 4 to 12 oz. of zinc are required per ounce of gold recovered.

This method is only suitable where the particles of gold are very finely divided owing to the length of time required for solution of larger particles of gold. It is much used in the Transvaal, Australia, New Zealand, India, and America, and provides 25 per cent. of the entire world production of gold.

CY'ANIN. The blue colouring-matter of certain flowers, as of the violet, corn-flower, etc.

CY'ANINES, or **CYANINE DYES.** The name given to a group of dyes derived from quinoline.

CY'ANITE, or **KYANITE.** A mineral aluminium silicate, crystallizing in the triclinic system. Its prevailing colour is blue but of varying shades. It occurs in schists, in which it has arisen under metamorphic action. The best-known examples are from the south side of the St. Gothard Pass.

CYAN'OGEN, C_2N_2. A colourless, exceedingly poisonous gas with an odour resembling that of peach kernels. It is found in small quantities in the gases from coke-ovens and blast-furnaces. *See* CYANIDES.

CYANOPHY'CEÆ. *See* BLUE-GREEN ALGÆ.

CYANO'SIS. Blue discoloration of the skin due to imperfect oxidation of the blood. It is usually most marked in the face and extremities, but is seen all over the body surface in infants with congenital heart disease (blue babies). It is produced by interference with the normal respiratory action of the lungs, and is, therefore, frequently present in diseases of the heart and lungs. During acute attacks it is a sign of grave significance, but in chronic heart and lung conditions a considerable degree of cyanosis may be present when the patient is able to get about.

CYAN'OTYPE PROCESS. A photographic picture obtained by the use of a cyanide. This process is in very common use by architects and engineers for copying plans, producing an image with white lines upon a blue ground. Sensitive paper is made by brushing it over with a solution of ferric oxalate (10 gr. to the oz.); it is then exposed under the positive and treated with a solution of potassium ferricyanide, by which the image is developed. The colour of the ground is deepened by subsequent washing with solution of potassium bisulphate.

CYANURIC ACID, $(CONH)_3$. Produced by the condensation of cyanic acid vapour above 150° C. and by heating urea, $CO(NH_2)_2$, above its melting-point until it solidifies. $3CO(NH_2)_2 = (CONH)_3 + 3NH_3$. The acid crystallizes in colourless prisms containing two molecules of water; it is insoluble in alcohol, and gives a characteristic violet precipitate with ammoniacal copper sulphate solution.

CYATHE'A. A large genus of arborescent ferns, ord. Cyatheaceæ, characterized by having the spores, which are borne on the back of the frond, enclosed in a cup-shaped indusium. There are many species scattered over the tropical regions of the world. *C. medullāris* is a fine New Zealand species of comparatively hardy character. The soft pulpy medullary substance in the centre of the trunk is an article of food, somewhat resembling sago.

CYATHEA'CEÆ. A family of Leptosporangiate ferns, section Gradatæ, consisting mainly of tropical and sub-tropical tree-ferns. The principal genera are Alsophila, Cyathea, and Hemitelia. See preceding article.

CYBELE (sib'e-lē). Originally a goddess of the Phrygians, the great Mother Deity, and, like Isis, the symbol of the moon. From Asia Minor her cult spread to Thrace and the islands, and finally to Greece and to Rome. Her worship was celebrated with a violent noise of instruments and rambling through fields and woods, and her priests were eunuchs in memory of *Attis* or *Atys* (q.v.). In

later times she was represented as a matron, with a mural crown on her head, in reference to the improved condition of men arising from agriculture and their union into cities.—Cf. L. R. Farnell, *Cults of the Greek States* (vol. iii.).

CYCADA'CEÆ, or CYCADS. A nat. ord. of Gymnosperms (q.v.), resembling palms in their general appearance, and, as a rule, increasing by a single terminal bud. The leaves are large and pinnate, and usually rolled up when in bud like a crozier. The microscopic structure of the wood as well as the general structure of their cones ally them with the conifers. The plants of this order inhabit India, Australia, Cape of Good Hope, and tropical America. Many are fossil.

CYCADOFILICES. *See* PTERIDOSPERMS.

CYCADOIDEA (also called **BENNETTITES**). One of the chief genera of the Bennettiteæ (q.v.), an extinct family of gymnosperms found in Mesozoic rocks in Europe and North America. Some, such as *C. ingens*, had complicated cones containing both ovules and pollen-sacs, and to some extent resembling the flowers of angiosperms.

CYCLADES (sik'la-dēz), or **KYKLADES** (Gr. *kylos*, circle). The principal group of islands in the Grecian Archipelago, belonging to the Republic of Greece, so named from lying round the sacred island of Delos in a circle. The largest islands of the group are Andros, Paros, Myconos, Tenos, Naxos, Melos, and Thera or Santorin. They are of volcanic formation and generally mountainous. Some are very fertile, producing wine and olive-oil; others are almost barren. The inhabitants are excellent sailors. Pop. 129,702.

CY'CLAMEN. A genus of plants, nat. ord. Primulaceæ. The species are low-growing herbaceous plants, with very handsome flowers. Several of them are favourite spring-flowering greenhouse plants. An autumnal-flowered species (*C. hederæfolium*) has become naturalized in parts of the south of England. The fleshy corms, though acrid, are greedily sought after by pigs; hence the vulgar name, *Sowbread*.

Flower of Cyclamen

CYCLANTHA'CEÆ. A small family of tropical American monocotyledons, intermediate between palms and aroids. Chief genus, Carludovica.

CYCLE (sī'kl; Gr. *kyklos*, a circle), used for every uniformly returning succession of the same events. On such successions or cycles of years rests all chronology, particularly the calendar. Our common solar year, determined by the periodical return of the sun to the same point in the ecliptic, contains fifty-two weeks and one day, and leap-year a day more. Consequently in different years the same day of the year cannot fall upon the same day of the week. And as every fourth year is a leap-year, it will take twenty-eight years (4×7) before the days return to their former order according to the Julian calendar. Such a period is called a *solar cycle*.

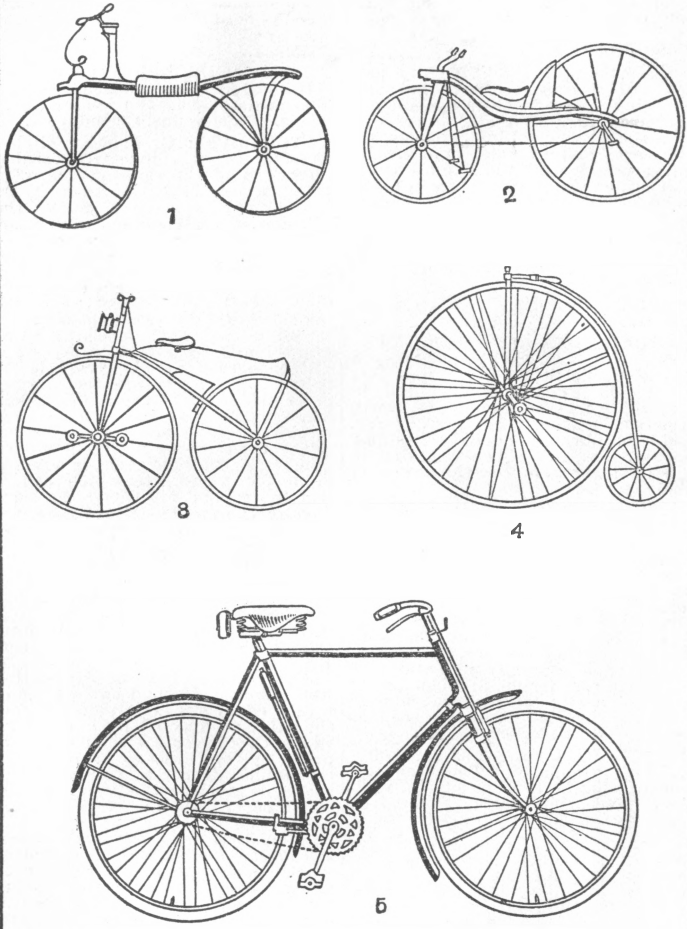
The **cycle of the moon**, or golden number, or Metonic cycle, is a period of nineteen years, after which the new and full moons return on the same days of the month.—In physics, the term is applied to a series of operations which, performed upon a system, brings it back to its original state.

CYCLE AND CYCLING. A cycle or velocipede is a light vehicle propelled by the person or persons whom it carries, and in its most common form is a bicycle, being two-wheeled. (*See* BICYCLE.)

A forerunner of the bicycle, dating from about 1817, had two wheels of nearly equal size, one placed before the other, connected by a beam on which the driver sat, and was propelled by the thrust of his feet upon the ground. The "dandy horse" was the name given to this form of cycle, which never came into very common use.

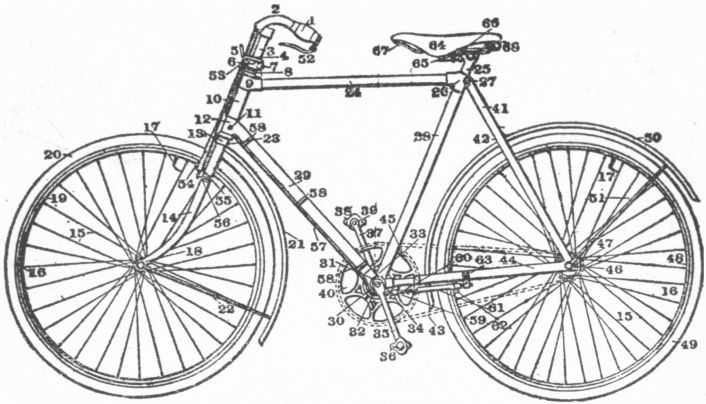
About 1861 a superior machine was introduced, having treadles operating cranks on the axle of the front wheel, and soon many forms became popular; but for a time the bicycle was a clumsy contrivance, on which any speed was only attained by considerable exertion, and the derisive name of "bone-shaker" was not undeserved. The machine, however, formed the basis of the various kinds of cycle which followed.

The bicycle of to-day, built almost entirely of steel (or, in some cases, of aluminium) with the greatest economy of material, and furnished with



CYCLES

1, Hobby Horse, 1818. 2, Kirkpatrick's, 1839. 3, Boneshaker, 1869. 4, Ordinary (Penny-farthing), 1884. 5, Safety of To-day.



THE PARTS OF A CYCLE

1, Handle-grips.
2, Handle-bar.
3, Handle-bar stem.
4, Head lock nut.
5, Lamp bracket.
6, Head clip clamp.
7, Head clip bolt and nut.
8, Steering lock.
9, Top head lug.
10, Head tube.
11, Head oil-hole cover.
12, Bottom head lug.
13, Fork crown.
14, Fork side.
15, Spokes.
16, Spoke nipples.
17, Valves.
18, Front hub spindle and nuts.
19, Front rim.
20, Front tyre.
21, Front mudguard.
22, Front mudguard stay.
23, Front mudguard clip.
24, Top tube.
25, Saddle pillar.
26, Seat lug.
27, Seat lug bolt and nut.
28, Seat tube.
29, Bottom tube.
30, Bottom bracket axle.
31, Bottom bracket cup.
32, Bottom bracket locking bolt.
33, Bottom bracket lubricator.
34, Crank cotter and nut.
35, Left crank.
36, Left pedal.
37, Right crank.
38, Right pedal.
39, Right pedal spindle
40, Front chain wheel.
41, Seat stay.
42, Seat stay bridge.
43, Chain.
44, Chain stay.
45, Chain stay bridge.
46, Chain stay end.
47, Chain adjusting bolt and nut.
48, Back rim.
49, Back tyre.
50, Back mudguard.
51, Back mudguard stay.
52, Brake lever (inverted).
53, Front brake adjusting bolt and nut.
54, Front brake stirrup.
55, Front brake block.
56, Front brake fork clip.
57, Back brake cable.
58, Back brake cable clips.
59, Back brake cable adjuster.
60, Back brake compression spring.
61, Back brake stirrup.
62, Back brake block.
63, Back brake stay clip.
64, Saddle.
65, Saddle clip.
66, Saddle clip nut.
67, Saddle adjusting screw (for tension).
68, Saddle back plate.

the countless improvements gradually introduced, leaves little to be desired as regards lightness and facility of propulsion.

The "high" bicycle, with a very small rear wheel and a front wheel sometimes as much as 60 inches in diameter, was at the height of its popularity about the "eighties." It gave its rider a commanding view of scenery, and could be driven at great speed; but its height made a fall a serious matter, and it gradually gave place to various forms of the low "safety" bicycle, of which that now familiar to all is practically the sole survivor.

Contemporary with the "high" bicycle were many forms of tricycle, a machine which had a considerable vogue. The tricycle, while affording greater stability than the bicycle, was heavier and more cumbrous to drive, took up a good deal of space, both on the road and when housed, and was by no means entirely free from danger, being in some circumstances more liable to upset than the bicycle. Except for use as a tradesman's parcel-carrier it has now almost wholly disappeared, as have also the tandem bicycles once popular.

The "high" bicycles, as also the earlier "safeties," were fitted with solid tyres of india-rubber, an improvement which reduced jolting to the rider and much wear and tear to the machine. These were succeeded by "cushion" tyres, larger in size and with a hollow centre; which were in turn replaced by the present pneumatic tyres, hollow and of large diameter, which are pumped full of air and kept in that state while the cycle is in use.

A still later innovation was the "free wheel" now practically universal; the action of "back-pedalling" has no effect in checking the forward movement of the machine, and the rider can run down a decline while keeping feet and pedals motionless.

This change called for increased brake-power, and the brake is now usually duplicated. The brakes may press on the tyres, on the rims of the wheels, or on the band, and are either applied by hand or by reversing the pedals. Ball-bearings in the hubs, bearings, and other parts of the machine, reduce to a minimum the friction of rotation. Bicycles are fitted with either single-, two-, or three-speed gears, the two last giving additional hill-climbing power.

Small motor-engines can be fitted to ordinary bicycles, but in more general use are the motor-cycles now common, in which the motive power is a petrol-driven engine. In these machines the rider may carry a companion in a "trailer," fore-car, or the more general "side-car."

A quite recent development of the motor-cycle is the motor-scooter. This novelty consists of a platform carried on two very low wheels; the rider sits upon or is supported by a seat raised high, and steers by a pillar connected with the front wheel. The speed is low, and the machine is chiefly suitable for use in towns.

The speed attained by an expert on an ordinary modern bicycle is considerable, 1 mile having been covered in about 1¼ minutes—in much less in America on a special track, on which the rider was protected from the wind by a preceding train—10 miles in about 11¼ minutes, and 50 miles in about 55½ minutes. Coming to longer distances, 100 miles have been covered in 2 hours 26 minutes, and 634 miles 774 yards in 24 hours (1899); while the 874 miles from Land's End to John o' Groats has been ridden in 3 days, 5 minutes, 49 seconds.

A remarkable cycling feat was Mr. Thomas Stevens's journey of 12,000 miles across the continents of America, Asia, and Europe, commenced in April, 1884, at San Francisco. A longer ride was performed by Mr. (now Sir) John Foster Fraser and two companions during 1896, 1897, and 1898, the three riders covering 19,237 miles in 774 days.

Cycling is now exceedingly common, being practised wherever the nature of the roads permits. It not only affords a healthy exercise, enabling the rider to enjoy fine scenery and to travel from place to place with cheapness and ease, but is most valuable for business purposes. Tradesmen distribute goods by cycle, workmen and others use machines in going to and from their work. The cyclist, more especially the motor-cyclist, played a most useful and conspicuous part in the European War.

The manufacture of cycles is a very important industry, the chief English centres of the trade being Coventry, Birmingham, London, Nottingham, and Wolverhampton. Cycling clubs are numerous.

The Cyclists' Touring Club (C.T.C.) and the National Cyclists' Union (N.C.U.) are more comprehensive bodies, the former having an international character. Both have done good service, not only to cyclists but also to the general public, by bringing about improvements in road maintenance, hotel service, and other matters.

In the United Kingdom bicycles, tricycles, and similar machines are declared by law to be carriages within the meaning of the Act relating to roads and highways, and the following special enactments are in force: "During the period between one hour after sunset and one hour before sunrise, every person riding or being upon such a carriage shall carry attached to the carriage a lamp, which shall be so constructed and placed as to exhibit a light in the direction in which he is proceeding, and so lighted and kept lighted as to afford adequate means of signalling the approach or position of the carriage. Upon overtaking any foot-passenger or cart or carriage, or any horse, mule, or other beast of burden, the rider must, by sounding a bell or otherwise, give audible and sufficient warning of the approach of the carriage." By the Road Transport Lighting Act, 1927, cyclists must use a single front light and at the rear must show either a red light or use an efficient red reflector, but no light is necessary if the cycle is being wheeled.:

BIBLIOGRAPHY: H. H. Griffin, *Cycle Repairing and Adjusting*; A. J. Wallace Taylor, *Modern Cycles*; A. J. Wilson, *The Art and Pastime of Cycling*; Lord Albemarle and G. L. Hillier, *Cycling* (Badminton Library); R. J. Macready and G. Stoney, *The Art and Pastime of Cycling*; P. Henry *Cycle Building and Repairing*.

CYCLIC ARRANGEMENT. Of leaves, etc., the condition in which several members of the same kind are attached at the same level, as when leaves are opposite (paired) or in

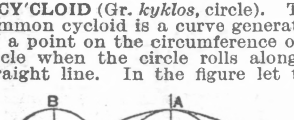
Cyclic arrangement of Leaves
Opposite (left). In whirls (right).

whorls. The best examples are to be seen in flowers. It is opposed to spiral arrangement.

CYCLIC POETS. A name given by Greek grammarians to a number of minor poets, who wrote on events preceding and following the Trojan War. Their works formed a complete cycle dealing with the Trojan story. The principal cyclic poems were the *Cypria* of Stasinus, the *Æthiopis* and *Iliou Persis* of Arctinus, the *Little Iliad* of Lesches, the *Nosti* of Hagias, and the *Telegonia* of Eugammon.

CYCLOBRANCHIATA (sī'klō-brang-ki-ā'ta). An order of gasteropods, in which the branchiæ or organs of respiration form a fringe around the body of the animal, between the edge of the body and the foot. The order consists principally of the limpets.

CY'CLOID (Gr. *kyklos*, circle). The common cycloid is a curve generated by a point on the circumference of a circle when the circle rolls along a straight line. In the figure let the



circle (diameter AB) make one revolution upon the straight line ABA, equal in length to its circumference, then the curved line AAA, traced out by that point of the circle which was in contact with the point A of the straight line when the circle began to roll, is called a common cycloid.

It is the curve of quickest descent from one point to another, and it is the curve along which a particle must vibrate under gravity, if its vibrations are to be absolutely isochronous, that is to say, if the period of vibration is to be independent of the extent of the swing. If a circle rolls externally upon another circle, a point on the circumference traces out an *epicycloid*; if internally, an *hypocycloid*. If the point be not on the circumference, the curves formed are called *trochoids*. These curves are very important in the designing of the teeth of wheels for machinery.

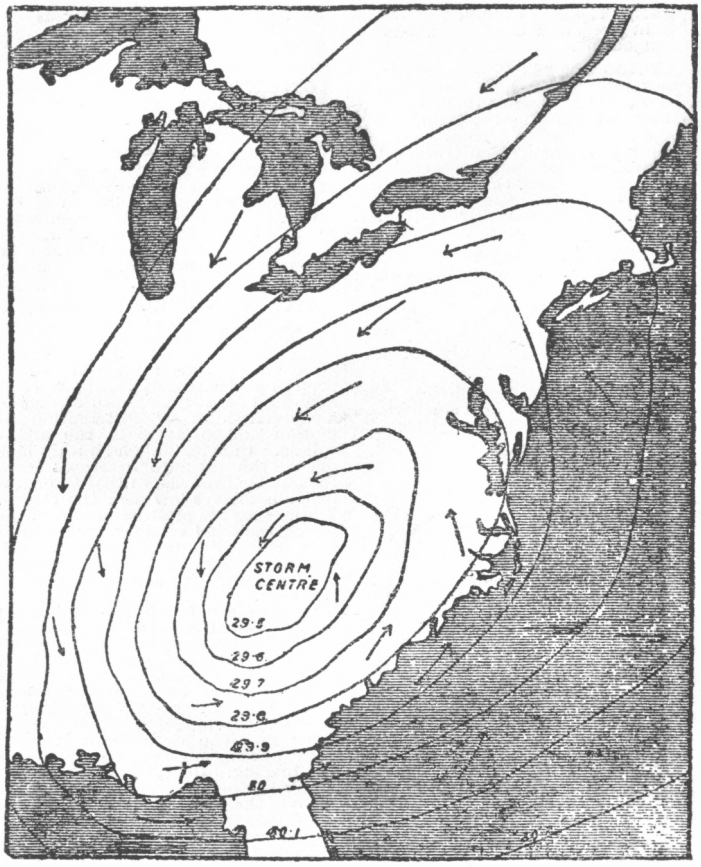
CYCLOID FISHES. An order of fishes according to the arrangement of Agassiz, having smooth, round or oval, scales, as the salmon and herring. The scales are formed on concentric layers, not covered with enamel and not spinous on the margins; they are generally imbricated, but are sometimes placed side by side without overlapping. The order is not recognized by modern authorities, but the term cycloid is still employed in describing the scales of fishes.

CYCLOMETER. An instrument attached to a bicycle or motor-cycle to record the distance gone by the machine. A stud, clamped to the spoke of a wheel, engages with a small star-wheel outside the case of the cyclometer, and moves it forward by one tooth for each revolution of the wheel. The star-wheel is connected to a clock-work mechanism, the motion of which brings into view on a dial the number of miles which the machine has travelled.

CYCLONE (sī'klōn). A term originally applied to the violent storms which occur in the Bay of Bengal and other parts of the tropics, generally after an ominous calm and sudden drop of the barometer. The word is now used in a wider sense to denote a special kind of distribution of motion and pressure in the atmosphere. In a region where a cyclone exists, the pressure decreases from the outside inwards, so that the barometer is always low near the centre. The steeper the pressure gradient, the higher the wind velocity. The winds blow spirally inwards towards the centre, counter-clockwise in the northern hemisphere, and clockwise in the southern.

Outside the tropics, a cyclone is usually called a depression, in allusion to the lowering of the barometric height. Depressions vary much in size. The diameter may be as low as 100 miles, but its average value is about 1000 miles. A depression is, as a rule, accompanied by much cloud and rain. The air in front is close, but towards the rear it becomes clear and bracing. Depressions are not, of course, stationary. The velocities and paths of their centres depend on many conditions. They move more quickly in winter than in summer, and deep depressions more quickly than shallow ones. The average rate, moreover, varies much in different countries. In the United States it is 26 miles an hour, in Western Europe 16 miles an hour. These are averages for the year. The winter rate is about double the summer rate.

The term anticyclone (q.v.) was first used by Sir Francis Galton to describe a condition of pressure and circulation just the reverse of the cyclonic condition. The business of weather forecasting is very much a matter of getting news of approaching depressions and anticyclones, and estimating their probable motion. *See* FORECASTING THE WEATHER; METEOROLOGY.



A Cyclone in the Eastern States of America

CYCLO'PEAN WORKS. In ancient architecture, masonry constructed with huge blocks of stone unhewn and uncemented, found in Greece, Sicily, Asia Minor, etc. The term originated in Greece, where such structures were supposed to have been the work of the Cyclopes, a people who were said to have come from Thrace or Lydia, and to have built the mighty walls of Tiryns, Mycenæ, and Argos for King Proteus. A similar style of work is to be found in the British Isles, as the Rock of Cashel in Ireland or the Laws near Broughty Ferry in Scotland.

CY'CLOPS (Gr. *Kyklōps*, literally round-eyed, pl. *Kyklōpes*; in English the word is used as a singular or a plural). A fabled race of one-eyed giants, variously described in Greek mythology. In Homer they are gigantic cave-dwellers and cannibals, while in Hesiod they are the three sons of Urānus and Gē (Heaven and Earth), slain by Apollo. They were often represented as a numerous race living in Sicily and rearing cattle and sheep. Of such is the Cyclops of the *Odyssey*. Later traditions describe them as the servants of Vulcan working under

Ætna, and engaged in forging armour and thunderbolts.—Cf. J. E. Harrison, *Myths of the Odyssey*.

CYCLOPS. The generic name of a certain minute Crustacean, ord. Copepoda, having but one eye, situated in the middle of its forehead.

CYCLOSPOREÆ. *See* BROWN ALGÆ.

CYCLOS'TOMI. Lampreys and hags, which constitute the lowest order of fishes, while some authorities regard them as forming a distinct class, of lower rank than fishes. They are eel-shaped, scaleless creatures, devoid of lower jaw, and possessing a suctorial mouth studded with horny projections, by which they scrape away the flesh of various fishes on

Cyclopean Walls and Gateway, Mycenæ

which they live as parasites. Sometimes called Marsipobranchii. *See* HAG; LAMPREY.

CYDNUS (sid'nus). A river in Cilicia, rising in the Taurus Mountains anciently celebrated for the clearness and coolness of its waters. Cleopatra made a voyage on this river to meet Antony.—Cf. *Antony and Cleopatra*, ii, 2, 191 *seq*.

CYGNUS (sig'nus; "the swan") One of Ptolemy's northern constellations. Within this constellation is one of the richest portions of the Milky Way. In it appeared in 1876 a new or temporary star which attained the third magnitude, and in Aug., 1920, one which at its brightest was above the second magnitude.

CYL'INDER. A geometrical solid which, in popular language, may be described as a long round solid body, terminating in two flat surfaces of circular shape which are equal and parallel. There is a distinction between *right* cylinders and *oblique* cylinders. In a right cylinder, the axis, that is, the straight line joining the centres of the two opposite bases, must be perpendicular to the flat ends. The curved surface of such a cylinder may be regarded as described by the revolution of a rectangular parallelogram round one of its longer sides (the axis). The axis of an oblique cylinder is not perpendicular to the ends.

In steam-engines, the cylinder is the chamber in which the steam expands and forces the piston outwards or inwards.

CYLIN'DRICAL LENS. A lens whose surfaces are cylindrical, instead of spherical as is usually the case. In a cylindrical lens the position of the image of a line depends on the direction of the line. Lenses of cylindrical form are employed as spectacle glasses to correct astigmatism. *See* ASTIGMATISM.

CYLIN'DRICAL VAULTING. In architecture, the most ancient mode of vaulting, called also a wagon, barrel, or tunnel roof. It is a plain half-cylinder without either groins or ribs.

CYLLENE (sil-lē'nē; modern name **ZIRIA**). A mountain of Southern Greece, 7789 feet high. It is the fabled birth-place of Hermes.

CY'MA (Gr. *kyma*, swelling). In architecture, a wavy moulding the profile of which is made up as a curve of contrary flexure, either concave at top and convex at bottom or the reverse. In the first case it is called a *cyma recta*; in the second a *cyma reversa*. It is a member of the cornice, standing below the abacus or coruna.

CYM'BALS (Gr. *kymbalon*, from *kymbos*, cup). Musical instruments consisting of two hollow plates of brass, which emit a ringing sound when struck together. They are military instruments, but now form part of every orchestra. The best cymbals are made in China and Turkey.

CYMBELINE. A king of the Britons who lived at the beginning of the first century of our era, and whose capital was Colchester. The story used by Shakespeare in his drama is found in Holinshed's *Chronicle*.

CYME (sīm). In botany, a mode of inflorescence in which the principal axis terminates in a flower, and one or more secondary axes rise from the primary, each of these terminating

in a flower, while from these secondary axes others may arise terminating in the same way, and so on, giving a flat-topped or rounded mass. Examples may be found in the common elder and the Caryophyllaceæ.

The commonest types of cyme are : (1) the dichasium or dichasial cyme, in which the secondary axes are paired, well seen in the Caryophyllaceæ ; (2) the monochasium or monochasial cyme, in which only a single lateral axis continues the branch-system each time ; there are several varieties of the monochasium, among which the scorpioid cyme of the Boraginaceæ is the most familiar. *See* INFLORESCENCE.

CYMENE, $C_{10}H_{14}$. A colourless, pleasant-smelling liquid of frequent occurrence in the volatile oils.

CYMMRODORION. Society for preserving Welsh literature and nationality. Established for instructing the ignorant and relieving the distressed in 1751, it ceased in 1781. It was revived for promoting literary study in 1820 and published two volumes of transactions down to 1843. Reconstituted, largely through Sir Hugh Owen, as the Honourable Society of Cymmrodorion, of London in 1877, it publishes annual transactions and ancient MS. records. The offices are at 64 Chancery Lane, London, W.C. A similar society, established in 1792, which published various MSS., led to the revival of the national Eisteddfod.

CYMRI (kim'ri). A branch of the Celtic family of nations which succeeded the Gaels in the great migration of the Celts westwards, and which drove the Gaelic branch to the west (into Ireland and the Isle of Man) and to the north (into the Highlands of Scotland), while they themselves occupied the southern parts of Britain. At a later period they were themselves driven out of the Lowlands of Britain by the invasions of the Angles, Saxons, and Jutes, and compelled to take refuge in the mountainous regions of Wales, Cornwall, and the north-west of England. Wales may now be regarded as the chief seat of the Cymri.

CYNANCHE (sin-ang'ke). A name given to several diseases of the throat or windpipe, such as quinsy or croup.

CYN'ARA. A genus of Compositæ, in many respects like the thistle. The two best-known species are the artichoke and the cardoon.

CYNEWULF (kin'e-wulf). An Anglo-Saxon or early English poet, whose name we only know from its being given in runes in the poems attributed to him, viz. *Elene* (Helena), the legend of the discovery of the true cross ; *Juliana,* the story of the martyr of that name ; and *Crist* (Christ), a long poem incomplete at the beginning. The poems are preserved in two MSS., the *Exeter Book* and the *Vercelli Book,* both of the eleventh century. The name Cynewulf also occurs as the solution of one of the metrical riddles in the Anglo-Saxon collection. Other poems, *The Andreas, The Wanderer, The Seafarer,* etc., have been ascribed to him without sufficient grounds.

Cynewulf probably lived in the first half of the eighth century, either in Mercia, East Anglia, or Northumbria. From his poems we may gather that he spent the earlier part of his life as a wandering minstrel, devoting the later to the composition of the religious poems connected with his name. —BIBLIOGRAPHY : Stopford Brooke, *English Literature to the Norman Conquest* ; *Christ,* edited by Sir Israel Gollancz ; C. W. Kennedy, *The Poems of Cynewulf, translated into English.*

CYNICS (sin'iks ; Gr. *kynikos,* dog-like, from *kyōn,* dog). A sect of philosophers among the ancient Greeks, founded by Antisthenes, a pupil of Socrates, at Athens, about 380 B.C. Their philosophy was a one-sided development of the Socratic teaching of Antisthenes and his followers, who looked only to the severer aspect of their master's doctrines, and valued themselves on their contempt of arts, sciences, riches, and all the social civilization of life. They subordinated scientific inquiries to the attainment of virtue, which they made to consist in entire self-denial and independence of external circumstances. They preached a " return to nature " as an escape from social convention with its ills.

In time this attitude degenerated into a kind of philosophic savagery and neglect of decency, and the Cynics fell into contempt. They had a scrupulous antipathy to the use of soap and water. It must, however, be admitted that ideals which humanity has as yet neither realized nor appreciated originated with several philosophers of the Cynic school. In some of their habits and ways of life the Cynics somewhat resembled the friars of the Middle Ages.

CYNIPIDÆ, or **GALL-FLIES.** A family of hymenopterous insects remarkable for their extremely minute head and large, elevated thorax. The females are provided with an ovipositor by which they make holes where they deposit their eggs in different parts of plants, thus producing those excrescences which are known as galls. The gall of commerce used in manu-

facturing ink is caused by the *Cynips gallæ tinctoriæ* piercing a species of oak which grows in the Levant The *Rhodites rosæ*, or bedeguar gall-fly, produces the hairy excrescences seen on the rose-bush and the sweet-briar. (*See* BEDEGUAR.)

Besides true gall-flies the family also includes minute guest-flies, which lay their eggs in galls; and certain parasitic species that deposit their eggs in aphides and the larvæ of two-winged flies.

CYNOGLOS'SUM. Hound's-tongue, a genus of Boraginaceæ, consisting of herbs from the temperate zones, with hooked nutlets. *C. officināle* and *C. montānum* are British plants.

CYNOMO'RIUM. A genus of parasites, nat. ord. Cynomoriaceæ. *C. coccinĕum*, the *fungus melitensis* of the old herbalists, is a small plant which grows in Sicily, Malta, and Gozo, and was valued as an astringent and styptic in dysentery and hæmorrhage.

CYNOSCEPH'ALÆ (Gr., "dogs' heads"). A range of hills in Thessaly memorable for two battles fought there in ancient times. The first was 364 B.C., between the Thebans and Alexander of Pheræ, in which Pelopidas was slain; and the second 197 B.C., in which the last Philip of Macedon was defeated by the Roman consul Flamininus.

CYNOSU'RA, or **CYN'OSURE** (literally "dog's tail"). An old name of the constellation Ursa Minor or the Lesser Bear, containing the north star. The word is also applied to any conspicuous object, and has become popular through Milton's lines in *L'Allegro*:

> Where perhaps some beauty lies,
> The cynosure of neighbouring eyes.

CYN'THIUS. A surname of Apollo, from Mount Cynthus, Island of Delos, on which he was born. For the same reason Diana, his sister, is called Cynthia.

CYPERA'CEÆ. The sedges, a nat. ord. of monocotyledonous plants including fully 2000 known species. The members of this order are grassy or rush-like plants, generally growing in moist places on the margins of lakes and streams. Their stem is a cylindrical or triangular culm with or without knots; the leaves are sheathing. They are of little or no economical use with the exception of *Cyperus Papyrus*, which furnished the papyrus of Egypt.

CYP'ERUS. A genus of plants, type of the ord. Cyperaceæ. They are herbs with compressed spikelets of many flowers, found in cold climates, and represented in the British flora by two very rare marsh plants which occur in the south of England —*C. longus*, the galingale, and *C. fuscus*. *C. esculentus*, the rush-nut, has tubers that are used for food in the south of Europe.

CY'PRESS. A genus of coniferous trees. The *Cupressus sempervirens*, or common European cypress, is a dark-coloured evergreen with extremely small leaves, entirely covering the branches. It has a quadrangular, or, where the top branches diminish in length, pyramidal shape.

Cypress trees, though of a somewhat sombre and gloomy appearance, may be used with great effect in shrubberies and gardens. They are much valued also on account of their wood, which is hard, compact, and very durable, of a reddish colour, and a pleasant smell. It was used at funerals and as an emblem of mourning by the ancients.

Amongst other members of the genus are the Indian cypress (*C. lusitanica*); the *C. funebris*, a native of China and Japan; the *C. Lawsoniana* of California, a favourite garden tree; and the evergreen American cypress or white cedar (*C. thyoides*).

The *Taxodium distichum*, or deciduous cypress of the United States and Mexico, is frequently called the Virginian cypress. Its timber is valuable, and under water is almost imperishable. In parts of the United States this cypress constitutes forests hundreds of miles in extent.

CYP'RIAN (Thascius Cæcilius), St. A Father of the African Church, born at Carthage about the beginning of the third century, and a teacher of rhetoric there. About 246 he was converted to Christianity, when he distributed his property among the poor, and began to live a life of the strictest abstinence. The Church in Carthage soon chose him presbyter, and in 248 he was made bishop. During the persecutions under Decius and Valerian he had twice to leave Carthage, but continued by his extensive correspondence to govern the African Church. He was beheaded in 258 for having preached the gospel in his gardens at Carthage.

Amongst his writings are eighty-one *Letters*, besides several works on doctrine.—Cf. *Life*, by Archbishop E. W. Benson.

CYPRIN'IDÆ. The carps, a family of soft-finned bony fishes, characterized by a small mouth, feeble jaws, gill-rays few in number; body covered with scales; and no dorsal adipose fin, such as is possessed by the silurus and the salmon. The members are the

least carnivorous of fishes. They include the carps, barbels, tenches, breams, loaches, etc. The type genus is Cyprinus.

The family includes about 1300 species, embracing most of the freshwater fishes of Europe, Asia, and North America; and about 100 which are native to Africa. The mahseer (*Barbus mosal*), which affords good sport in the mountain streams of India, attains the length of 6 feet. The silvery scales of the bleak (*Alburnus lucidus*) are used in the manufacture of artificial pearls, and the goldfish is a domesticated variety of a species of carp (*Cyprinus carassius*).

CYPRINODON'TIDÆ. A family of small soft-finned fishes, most of which are native to the fresh and brackish waters of America, but also represented in South Europe, Africa, and Southern Asia. The species of one American genus (Anableps) possess remarkable eyes, adapted for surface swimming, for the upper half of each is so modified in structure that it enables the fish to see objects above the water-level.

CYPRIPE'DIUM. Lady's slipper, a genus of plants of the nat. ord. Orchidaceæ. Only one species (*C. calceŏlus*) is a native of Britain. Its conspicuous flower consists of large spreading red-brown sepals and petals, and an obovoid pale-yellow lip.

CYP'RIS. A genus of minute freshwater Crustaceans. The body is enclosed in a delicate bivalve shell. It is common in stagnant pools, and is very often found in a fossil state.

CY'PRUS. An island lying on the south of Asia Minor, and the most easterly in the Mediterranean. Its greatest length is 141 miles; maximum breadth, about 60 miles; area, 3584 sq. miles.

Physical Features.—The chief features of its surface are two mountain ranges, both stretching east and west, the one running close to the northern shore, and extending through the long north-eastern horn or prolongation of the island, the other and more massive (Mount Olympus) occupying a great part of the south of the island, and rising in Troödos to 6406 feet. Between them is the bare and mostly uncultivated plain called Mesaoria.

The climate is in general healthy. The mountains are covered with forests of excellent timber (now under Government supervision), and the island is esteemed one of the richest and most fertile in the Levant. There are irrigation works for the storage and distribution of rain-water.

Agriculture, however, is in a very backward state, and locusts sometimes cause great damage. One-third only of arable land is under cultivation. Wheat, barley, cotton, tobacco, olives, raisins, and carobs are the most important vegetable products. The wine is famous, especially that known as *commandery*. Silk-worms are reared, and a coarse kind of silk is woven. Salt in large quantities is produced.

The minerals are valuable; the copper-mines were of great importance in ancient times (the name *copper* is derived from that of this island), and are again being worked; gypsum, terra umbra, and marble are found in abundance. Large numbers of sheep and goats are reared on the extensive pasture lands of the island.

The principal towns are Lefkosia or Nicosia, the capital, the only considerable inland town, and the seaports Larnaca and Limasol. The chief exports are carobs, wine, and cotton, with cheese, raisins, cocoons, and wool.

History.—After belonging successively to the Phœnicians, Greeks, Egypt, Persia, and again Egypt, Cyprus in 57 B.C. became a Roman province, and passed as such to the eastern division of the empire. In 1191 it was bestowed by Richard of England (who had conquered it when engaged in the third Crusade) on Guy de Lusignan, and after his line was extinct it fell into the hands of the Venetians (1489), with whom it remained till it was conquered by the Turks in 1571 and annexed to the Ottoman Empire. In 1878 it was ceded to Britain by the Convention of Constantinople concluded between England and Turkey, its reversion to Turkey being provided if Russia should give up Batoum and Kars. Britain was also bound to pay a subsidy to Turkey annually amounting to about £93,000, but this was not paid directly, being retained as an offset against British claims on Turkey.

On the outbreak of hostilities with Turkey on 5th Nov., 1914, Great Britain annexed Cyprus, and in 1925 it became a Crown Colony. The island has become much more prosperous under British administration.

Constitution.—In 1925 the High Commissioner became Governor; there was an Executive Council and a Legislative Council, but the latter went out of existence in 1931, the power to make laws being vested in the Governor-in-Council.

The antiquities of the island have been the subject of repeated investi-

ıtions. In recent times excavations ıave been conducted by the Cyprus xploration Fund and the British .useum. Pop. 347,959, of whom ıore than three-fourths belong to ıe Greek Church.

BIBLIOGRAPHY: C. D. Cobham, *n Attempt at a Bibliography of yprus*; Colonel Fyler, *Development f Cyprus and Rambles in the Island*; . Mariti, *Travels in Cyprus*; . W. J. Orr, *Cyprus under British ule*; H. C. Luke and O. J. Jardine, *he Handbook of Cyprus*; E. G. effery, *Historic Monuments of Cyprus*.

CYP'SELUS. A genus of birds, ype of the family Cypselidæ, in- luding the swifts and their congeners.)ne peculiarity in this family is that he hind toe is turned forward along vith the three anterior toes. The ommon swift (*Cypselus apus*), a ummer visitor to Britain, is black n colour except for a grey patch on he chin. It lives entirely on insects, vhich it pursues in the air, and its hrill cries are characteristic. Swifts of the genus Collocalia, native to slands of the Indian and Pacific)ceans, construct the edible nests hat are esteemed by the Chinese. These consist almost entirely of the ıardened secretion of large glands hat open into the mouth cavity.

CYRANO DE BERGERAC, Savinien. French romance writer and dramatist. He was born in Paris, 16th March, 1620, and studied with a country priest, and in Paris. He served in the army in 1639–40, when he began the exploits for which he is famous, such as his single-handed adventure against 100 enemies. He began to write in 1642, mostly classical tragedies, but his most famous works are romances: *L'Histoire comique des Etats du soleil* (1662) and *L'Histoire comique des Etats de la lune* (1656 ?). He led a stormy life in Paris, quarrelling and duelling, and died in Sept., 1655.

CYRENAICA (si-re-nā'i-ka). Once a powerful Greek state in the north of Africa (corresponding partly with the modern Barca), west of Egypt, comprising five cities (Pentapolis), among which was Cyrene, a Spartan colony founded in 631 B.C. Afterwards it came into the hands of the Ptolemies, and in 95 B.C. the Romans obtained it. The Arab invasion ruined it (641). Under the rule of the Turks Cyrenaica was made a sanjak of the vilayet of Tripoli. The district was annexed by Italy on 23rd Feb., 1912. *See* TRIPOLI AND CYRENAICA.

CYRENAICS (si-re-nā'iks). A philosophical sect founded about 380 B.C. by Aristippus, a native of Cyrene and a pupil of Socrates. According to Socrates, man's rational life lay in the search after the true good, and the Cyrenaics taught that this true good could be found in nothing but pleasure. The Cyrenaic school was thus the precursor of the Epicurean.

CYRENE (si-rē'nē). In ancient times a celebrated city in Africa, about 10 miles from the north coast, founded by Battus and a body of Dorian colonists, 631 B.C. Numerous interesting remains have been discovered here. The town now occupying the site of the ancient Cyrene is a miserable place. *See* TRIPOLI AND CYRENAICA.

CYR'IL. The name of three Saints or Fathers of the Christian Church.—**1. Cyril of Jerusalem,** born there about the year A.D. 315, was ordained presbyter in 345, and in 350 or 351 became Patriarch of Jerusalem. He engaged in a warm controversy with Acacius, the Arian bishop of Cæsarea, by whose artifices he was more than once deposed from his episcopal dignity. He died in 386 or 388. We have some writings composed by him.

2. Cyril of Alexandria was educated by his uncle Theophilus, Patriarch of Alexandria, and in A.D. 412 succeeded him as Patriarch. In this position his ambitious spirit brought the Christians into violent quarrels. At the head of the populace he assailed the Jews, destroyed their houses and their furniture, and drove them out of the city. Orestes, the prefect, having complained of such violence, was attacked by 500 furious monks. The assassination of Hypatia, famous for her beauty and her lectures on Neo-Platonism, took place, it is said, at his instigation. His quarrel with Nestorius, and with John, Patriarch of Antioch, regarding the two-fold nature of Christ, convulsed the Church, and much blood was shed between the rival factions at the Council of Ephesus in 431, the emperor having at last to send troops to disperse them. Cyril closed his restless career in 444.

3. St. Cyril, "the Apostle of the Slavs," a native of Thessalonica. He converted the Chazars, a people of Hunnish stock, and the Bulgarians, about A.D. 860. He died about 869. He was reputed to be the inventor of the Cyrillian letters, which took their name from him.

CYRILLIAN LETTERS. Characters used in one of the modes of writing the Slavonic language, wrongly supposed to have been invented by Cyril, the Apostle of the Slavs. In Poland, Czecho-Slovakia,

and Lusatia, Roman or German letters are used; but amongst Russians, Bulgars, and all the Slavonic nations belonging to the Greek Church, the Cyrillic alphabet, a modification of the Greek one, is in use. The oldest-known document written in Cyrillic characters is an inscription of the Bulgarian Tsar Samuel, A.D. 993. Besides these there is the Glagolitic alphabet, in which the oldest literature of the Slavonic Church is written.

CY'RUS. King of Persia, a celebrated conqueror. The only ancient original authorities for the facts of his life are Herodotus and Ctesias. According to Herodotus, he was the son of Cambyses, a distinguished Persian, and of Mandane, daughter of the Median King Astyages. His grandfather, alarmed by a prophecy that his grandson was to dethrone him, gave orders that Cyrus should be destroyed after his birth. But the boy was preserved by the kindness of a herdsman, and at length sent to his parents in Persia. Here Cyrus soon gathered a formidable army, overthrew his grandfather (559 B.C.), and thus became King of Media and Persia. In 546 he conquered Crœsus of Lydia, and two years later took Babylon. He also subdued Phœnicia and Palestine, and restored the Jews from their Babylonish captivity. He was slain in battle with a Scythian nation in 529 B.C.

Such is the account given by Herodotus; but the narrative of Ctesias differs in not making Cyrus a relative of Astyages and in some other points. The *Cyropædia* of Xenophon, which was wrongly considered to give an historical account of the life of Cyrus, is really a philosophical romance.—BIBLIOGRAPHY: M. Duncker, *History of Antiquity*: A. Amiaud, *Cyrus, roi de Perse*.

CYRUS. Called the *Younger*, to distinguish him from Cyrus the founder of the Medo-Persian monarchy, was the second son of Darius Nothus or Ochus. Having formed a conspiracy against his elder brother, Artaxerxes Mnemon, Cyrus was condemned to death, but released at the request of his mother, Parysatis, and made Governor of Asia Minor. Here he secretly gathered an army, an important part of which consisted of 13,000 Greek auxiliaries, and marched eastwards. His brother with a large army met him in the plains of Cunaxa (401 B.C.), and in the battle which followed, although the troops of Cyrus were victorious, Cyrus himself was slain. The retreat of Greek auxiliaries of Cyrus from the interior of Persia to the coast of Asia Minor is the subject of Xenophon's *Anabasis*.

CYST. Cavity in the body containing fluid. It is usually enclosed by a tough fibrous layer. Retention cysts, formed by the blockage of ducts through inflammation or disease, may occur in breasts, kidneys, tongue, sinews, or skin. Dermoid cysts, containing sebaceous matter, sometimes develop teeth. Dog tapeworms, living as larvæ in man, form hydatid cysts.

CYSTICER'CUS. The encysted or passive stage in the life-history of certain tapeworms. The spots in "measly" pork are of this nature. *See* TAPEWORM.

CYSTID'EA. A class of fossil echinoderms, allied to the sea-lilies, with feebly-developed arms occurring in Palæozoic strata.

CYSTOP'TERIS. Bladder-fern, a genus of polypodiaceous delicate flaccid ferns. Two are natives of Britain, *C. fragĭlis* (the brittle fern), common, and *C. montāna*, very rare.

CYSTOT'OMY. In surgery, the operation of cutting into the bladder for the extraction of a calculus.

CYTHE'RA. *See* CERIGO.

CYT'ISIN. An alkaloid, discovered in 1818, by J. B. Chevreul, in the ripe seeds of the Laburnum. It is of a nauseous taste, emetic and poisonous.

CYT'ISUS. A genus of plants belonging to the nat. ord. Leguminosæ, sub-ord. Papilionaceæ. The members of the genus are shrubs or small trees, sometimes spiny, with leaves composed of three leaflets, and with yellow, purple, or white flowers. They belong to Europe, Asia, and North Africa, and are very ornamental plants.

The best-known species is the common laburnum (*C. Laburnum*). (*See* LABURNUM.) Another, common in greenhouses, is *C. fragrans*. The common broom (*C. Scoparius*) also belongs to this genus. (*See* BROOM.) It was this plant, Plantagenista, that formed the badge of the Plantagenets.

CYTOLOGY. The study of cells, which are the unit masses of the complex living substance (protoplasm, q.v.) that makes up the essential part of the bodies of organisms. The lowest plants (Protophyta), such as microscopic Algæ, yeast, and bacteria, and the lowest animals (Protozoa), including innumerable animalcules, are one-celled (*unicellular*). All other plants (Metaphyta) and animals (Metazoa) are many-celled (*multicellular*), and as

the scale of life is ascended there is increasing complexity in structure (*morphological differentiation*), in accordance with the division of physiological labour between groups (*tissues*) of suitably modified cells. (*See* HISTOLOGY.)

A typical animal cell is a fragment of protoplasm divided into cell-body (*cytoplasm*), and a highly specialized particle (*nucleus*) which plays a dominant part in cell-life. The cytoplasm usually appears to consist of a network of foam-like aggregate of living substance holding fluid in its interstices. Near the nucleus a minute part of it is modified into a rounded *centrosphere*, containing a little body (*centrosome*) that plays an important part in cell-division. The cytoplasm contains non-living granules (*metaplasm*) which either serve as building materials or are products of waste. The nucleus is bounded by a nuclear membrane, enclosing a very fine network of a substance (*linin*) in which are embedded numerous granules of another kind of material (*chromatin*) that stains deeply when treated with aniline or other dyes. There is also a relatively large particle (*nucleolus*), possibly consisting of reserve substances.

The study of the cell is of great theoretical and practical importance, for it discharges the various functions of life in the simplest possible form. It reproduces itself by a process of division, sometimes simple or *direct*, when the nucleus elongates and then divides into two, the halves sharing the cytoplasm, and two daughter-cells resulting.

More usually, however, division is *indirect*, and in this case the nucleus undergoes very complicated changes (*see* MITOSIS). The chromatin becomes a convoluted thread which breaks up into curved pieces (*chromosomes*), the number of these being constant for the same species, but in all cases being even (2, 4, etc.). Each chromosome splits longitudinally into two, one half going to each daughter-cell. But in the development of sex-cells there is *reducing division* (*meiosis*), the mature ovum or sperm only containing half the normal number of chromosomes. When an ovum is fertilized by fusion with it of a sperm, the normal number is, of course, restored. Hereditary characters are believed to be transmitted by means of chromosomes, and reducing division apparently provides for variation. A typical plant-cell agrees in most respects with the above description. But it is generally enclosed in a delicate elastic membrane (*cell-wall*) composed of cellulose, a substance allied to starch.

Parts of the cytoplasm are often specialized into small bodies (*plastids*) of different function. In green plants the typical pigment (*chlorophyll*) is contained in *chloroplastids*; *amyloplastids* are concerned with starch formation; and some pigments other than green (especially yellow and orange) are associated with *chromoplastids*.

Many plant-cells contain reserve materials, as starch grains, aleurone grains (proteins), sugar, and inulin; or waste products, including alkaloids. There is a large amount of cell-sap contained in variously arranged spaces (*vacuoles*). Centrospheres (and centrosomes) appear to be absent in the cells of higher plants. *See* CELL; CYTOPLASM; MITOSIS. For bibliography, *see* HISTOLOGY.

CYTOPLASM. In biology, the general protoplasm of a cell, as distinguished from the nucleus. It is commonly of fibrillar, reticulated, or alveolar structure, with fluid-filled interstices. In animal cells, near the nucleus, there is commonly a minute specialized sphere, the centrosphere, containing a particle, the centrosome, which plays an important part in division. Cytoplasm contains various granules of non-living matter, some of which are excretory products (e.g. crystals of oxalate of lime in plants), or building materials (e.g. starch grains and aleurone grains in plants).

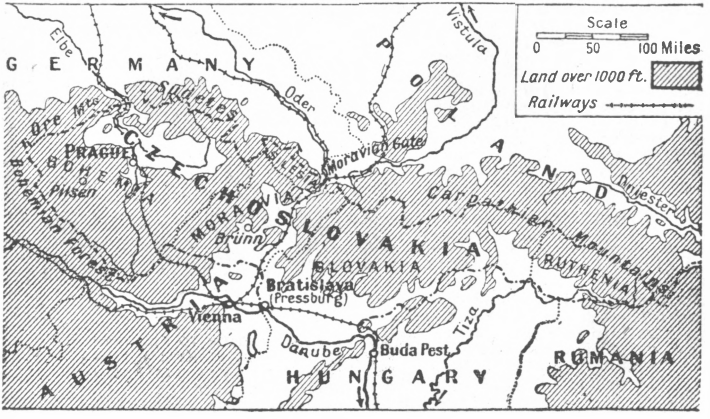
In plant-cells the cytoplasm often forms a lining to the cell-wall, surrounding a central space (vacuole) full of sap, and parts of it may be specialized into plastids, some of which contain chlorophyll (chloroplastids), others various pigments (chromoplastids), while others, again, are concerned with starch formation (leucoplastids). In unicellular animals (Protozoa) the cytoplasm is often highly differentiated.

CYTTARIA. A genus of ascomycetous Fungi, section Discomycetes, parasites on evergreen beeches in South America. The fruit-body is a pear-shaped gelatinous structure, covered with numerous pits containing the hymenium, the whole when ripe, resembling a small wasps' nest. During certain months of the year these fructifications form the staple food of the Tierra del Fuegians.

CYZ'ICUS. A peninsula of Asia Minor, 60 miles S.W. of Constantinople. It was once an island, and the site of an ancient town of the same name.

CZAR. *See* TSAR.

CZARTORYSKI (chär-to-ris'kē). **Adam George, Prince.** A celebrated Polish statesman and patriot, born 14th Jan., 1770, died 16th July, 1861. His education was completed at the University of Edinburgh and in London. He fought bravely under Kosciusko, and after the partition of his country in 1795 was sent to St. Petersburg (Leningrad), where he formed a close friendship with Prince Alexander, and was made Minister of Foreign Affairs. In 1805 he resigned his office, and withdrew soon after from public affairs. On the outbreak of the Polish Revolution in 1830 he took an active part and became the head of the National Government. After the failure he lived at Paris.



Map of Czechoslovakia

CZASLAU (chäs'lou). A town, Bohemia, Czechoslovakia, 45 miles E.S.E. of Prague. Here Frederick the Great defeated the Austrians (1742). Pop. 9190.

CZECHOSLOVAKIA. A central European republic created after the European War. It consists of Bohemia, Moravia, Silesia, Slovakia, and Ruthenia, all of which, prior to 1918, belonged either to Austria or Hungary. The area of the state is 54,207 sq. miles, and the population of 14,726,158 includes 7,345,137 Czechs and Slovaks, 3,088,530 Germans, 119,469 Hungarians, 80,182 Poles, and 458,094 Russians.

Towns.—The capital is Prague with a population of 848,081 (1930). Other towns and their populations (1930) are: Brno (263,646), Ostrava (125,347), Bratislava (123,852), Plzen (114,150), Kosice (70,232), Olomouc (65,989), Budejovice Ceske (43,886), Liberec (Reichenberg) (38,525, Opava (36,083), Prostejov (33,487), Chomutov (Komotau) (33,266, Cheh (Eger) (31,549), Jihlava (31,031), Teplice-Sanov (Teplitz-Schönau) (30,911).

Czechoslovakia, by the Constitution of 1920, is a democratic republic governed by a President elected for seven years, a Senate with 150 members renewed every eight years, and a Chamber of Deputies comprising 300 members, elected for six years. Freedom of speech, and of the press is guaranteed. Ruthenia is autonomous. The State religion is Roman Catholicism, and there are small minorities, belonging to Protestant and other Churches. In 1930 there were 10,833,423 Roman Catholics; 585,439 Greek and Armenian Catholics; 1,109,229 Protestants; 145,583 Orthodox; 356,768 Jews; 22,747 Old Catholics, and others. Elementary education is compulsory between the ages of six and fourteen, and there is ample provision for advanced students. Except in Slovakia, there are practically no illiterates. There are four universities, two at Prague (Czech and German), one at Brno (Czech), and one at Bratislava (Slovak). Prague and Brno have each Czech and German technical schools.

In the west of the country is the great plain of Bohemia, but elsewhere the surface is generally mountainous with fertile valleys. The boundaries are Germany, Poland,

Rumania, Hungary, and Austria. The principal rivers are the Elbe, the Moldau, the Vistula, the Oder, and the Danube, which crosses the southern boundary of Slovakia in certain places.

Agriculture is highly developed, and the principal products are rye, oats, barley, wheat, potatoes, beets, and fruits. The area under cultivation in 1931 was about 10,959,144 acres. About 460,873 acres were sown with beets, and the sugar industry (annual output 600,000 metric tons) is most important; 33 per cent. of the area is forest land. Hops are also grown for export and for the production of beer. In 1930 the yield of hops amounted to 14,725 metric tons.

Minerals include coal, lignite, iron, and graphite, while rock-salt, lead, and gold are found in the Carpathians. Hops of fine quality are extensively grown, and there is a large beer industry centred in Pilsen. The manufactures, which include woollens, cottons, and other textiles, glass, furniture, paper, and machinery, are indicated in the table shown below.

There were 12,033 factories in 1930.

The exports in 1932 were valued at £106,400,000, and went principally to Austria, Germany, and Great Britain. The imports were valued at £95,500,000, and came mainly from Germany, United States, and Austria.

Transport facilities are good except in the east of the republic. There were in 1930 8606 miles of railway track, of which 7002 miles was State owned. In 1931 there were about 49,000 miles of road, 5300 miles being maintained by the State. The expense of motor transport is exceptionally heavy. River transport on the Oder and the Danube is under State control. The monetary unit is the korona or crown.

Article or Product.	Chief Centres of Industry or Production.
Textiles	Liberec, Trutnov, Brno.
Sugar	Bohemia, Moravia, Slovakia.
Glass	North Bohemia, Moravia.
Timber and forestry	Bohemia, Moravia, Slovakia, Carpathians.
Machinery, etc.	Prague, Pilsen, Brno, and districts.
Coal	Kladno, Mahrisch, Ostrau.
Lignite	North Bohemia, Most (Brüx).
Paper	Bohemia, Moravia, Slovakia.
Chemicals	North Bohemia, Usti and Labem (Aussig).
Radium	Joachimsthal, North Bohemia.
Cereals and live-stock	Middle and South Bohemia, Moravia.

The Czechoslovaks revolted from Austria during the European War, and raised four armies to fight with the Allies. The republic came into being in 1918. *See* AUSTRIA-HUNGARY.—BIBLIOGRAPHY : J. Cisar and F. Pokorny, *The Czecho-Slovak Republic : a survey of its history and geography, its political and cultural organization, and its economic resources*; V. Nosek, *Independent Bohemia*.

CZECHS (chĕks). The most westerly branch of the great Slavonic family of races. The Czechs have their headquarters in Bohemia, where they arrived in the fifth century, although modern Czech scholars have endeavoured to prove that the Czechs inhabited part of the country long before the Christian era. The origin of the name is unknown. The total number of the Czechs (including Moravians, Slovaks, etc.) is about 8,800,000, and at the Peace Conference of 1919 they were given their independence in the state of Czechoslovakia. The Czechs proper, in Bohemia, number about 3,200,000. They speak a Slavonic dialect of great antiquity and of high scientific cultivation.

Czech Language.—The *Czech language* is distinguished as highly inflectional, with great facility for forming derivatives, frequentatives, inceptives, and diminutives of all kinds. Like the Greek it has a dual number. The alphabet consists of forty-two letters, expressing a great variety of sounds.—BIBLIOGRAPHY : Francis, Count Lützow, *A History of Bohemian Literature*; Morfill, *Grammar of the Bohemian or Czech Language*.

CZEGLED (tseg'lăd). A market town, Hungary, 39 miles S.E. of Budapest, in a district yielding large quantities of grain and wine. Pop. 37,344.

CZENSTOCHOWA. A town of Poland, in the province of Kielce. It is situated on the River Warthe, near the boundary of Silesia, and is connected by rail with Warsaw. Here is a monastery used by the monks of the order of Paul the Hermit, which contains a painting of the Virgin. It is visited annually by about 400,000 pilgrims from all parts of the country. The town manufactures cotton and woollen goods, also paper. Pop. (1931), 117,692.

CZERMAK, Jaroslav (1831-78). A Bohemian artist, was born at

Prague. He studied art in Belgium and Paris. Of his early works *Rudolph II.'s begging Court-Poets* is the most famous. He travelled in the Near East and painted pictures of the life there. Two of the most notable are *A Montenegrin Woman and Child* and *The Turks seizing a Herzegovinian Woman.*

CZERNIN, Count Ottokar. Austrian statesman, born in 1872. He was Austro-Hungarian Minister at Bucharest, during the European War, until Aug., 1916, when Rumania joined the Allies. In Dec., 1916, he succeeded Burian as Foreign Minister of Austria-Hungary, and was Austrian Delegate at Brest-Litowsk.

He was compelled to resign on 15th April, 1918, in consequence of a speech wherein he stated that Clemenceau had made offers of peace before the great German offensive of 21st March, a statement which Clemenceau proved to be untrue. Another reason of his retirement was the excitement caused by the publication of a letter written by the Emperor Charles to his brother-in-law, Prince Sixte of Bourbon-Parma, and sent by the latter to President Poincaré. Czernin published his reminiscences under the title of *In the World War* (1919).

CZERNOWITZ, or **CERNAUTZI.** A town of Rumania, formerly capital of the Austrian province of Bukovina, and situated on the Prut. The town was of great strategic importance during the European War, and was several times occupied by the Russians, for the first time on 15th Sept., 1914, and for the last time on 17th June, 1916. On 3rd Aug., 1917, the Germans re-entered the town. It is the seat of a Greek orthodox archbishop, and has a pop. of 111,122.

CZERNY (cher'ni), **George.** Hospodar of Serbia, born in the neighbourhood of Belgrade about 1770; beheaded by the Turks, July, 1817. His true name was George Petrovitch, but he was called *Czerny* or *Kara George*, i.e. Black George. In 1801 he organized an insurrection of his countrymen against the Turks, took Belgrade, and forced the Porte to recognize him as hospodar of Serbia. In 1813, however, he had to retire before a superior force, and took refuge in Austria. Returning to his country in 1817, he was taken and put to death.

CZERNY (cher'ni), **Karl.** Composer and musician. He was born at Vienna in 1791 and remained there throughout his life. He was a pupil of Beethoven, and at an early age became a teacher of music himself. His pupils included Liszt. His compositions for the piano were many, including masses, requiems, etc., but he is chiefly remembered for his admirable educational studies and exercises. He died in 1857.

D

D. The fourth letter in our alphabet, representing a dental sound formed by placing the tip of the tongue against the root of the upper teeth, and then forcing up vocalized breath, or voice, into the mouth, the soft palate being raised to prevent its escape through the nose. T is formed in the same way, except that it is uttered with breath merely and not with voice. As a numeral D represents 500.

DAB (*Pleuronectes limanda*). A fish belonging to the family of the Pleuronectidæ, or flat-fishes, comprising also the sole, turbot, halibut, lemon sole, plaice, and flounder, the last three being included in the same genus with the dab. It is of a pale-brownish colour spotted with white on the side (right), which it usually keeps uppermost, and white on the underside, and has rougher scales than the other members of the same genus.

DABCHICK. Popular name of the little grebe (*podicepes minor*). It has a greenish-black back and red breast, and dives with its young beneath its wings, or on its back. The Caroline, or pied-billed dabchick (*podilymbus podicepes*) is occasionally seen in Britain.

D'ABERNON, Viscount. English diplomatist. Edgar Vincent was born at Slinfold, Sussex, 19th Aug., 1857, and educated at Eton. He began his diplomatic career in Turkey. From 1883-89 he was Financial Advisor to the Egyptian Government and from 1889-97 Chairman of the Imperial Ottoman Bank. From 1899 to 1906 he was Unionist M.P. for Exeter, and in 1914 he was made a baron. He was Chairman of the Royal Commission on the resources of the Dominions, and from 1915-20 of the Central Liquor Control Board. From 1920-26, when he was made a viscount, D'Abernon was British ambassador in Berlin. His *Diary* appeared in three volumes in 1929-30.

DABOECIA. A genus of Ericaceæ. The only species, *D. polifolia*, St. Dabeoc's Heath, confined in Britain to Connemara and Mayo, is one of those curious "Atlantic types," natives of the Atlantic coasts of the European continent, which extend into the south-west of Britain, probably as relics of a time when the climate of these islands was warmer than at present.

DA CAPO (It., "from the head or beginning"). In music, an expression written at the end of a movement to acquaint the performer that he is to return to the beginning, and end where the word *fine* is placed.

DACCA. A large division of India, in Eastern Bengal, at the head of the Bay of Bengal; area, 16,240 sq. miles. It is one of the richest districts in India, and produces such quantities of rice as to be called the granary of Bengal. The surface is an uninterrupted flat, and is intersected by the Ganges and Brahmaputra—from whose periodical inundations its extraordinary fertility arises.

Dacca was at one time celebrated for its hand-woven muslins, which are still hardly to be equalled in their combination of durability and delicacy; but this branch of industry has considerably decayed. Pop. 12,837,311, Mohammedans being in a decided majority.

Dacca, the chief town, 150 miles N.E. of Calcutta, has much decayed with the extinction of its staple trade in the celebrated Dacca muslin; suburbs which once extended northwards for 15 miles are now buried in dense jungle. Dacca, being free from violent heats, is one of the healthiest and pleasantest stations in Bengal. An Indian university was founded at Dacca in 1921. Pop. (1931) 138,518.

DACE (*Leuciscus vulgāris*). A small river fish of the family Cyprinidæ, and resembling the roach but longer and thinner. It is a gregarious fish swimming in shoals and inhabiting chiefly deep clear streams with a gentle current. It seldom exceeds a pound in weight.

DACE'LO. An Australian genus of wood kingfishers, one species (*D. gigas*) of which is the "laughing jackass," so called on account of its harsh discordant note. Its food consists chiefly of frogs, small reptiles, and small mammals, to which fishes are sometimes added.

DACHSHUND. Breed of dog. It is a distorted hound with short crooked legs, and is employed in Germany in badger hunting. In Britain it is a favourite domestic dog. It has a cylindrical body, about 8 inches high at the shoulder and weighs from 15 to 21 lb. The ears are long and pendulous and the tail tapering. The dog is rough or smooth haired.

DA'CIA. In ancient times, a region north of the Danube, corresponding to modern Rumania and Transylvania, inhabited by the Daci or Getæ, afterwards a Roman province. It was conquered by the Emperor Trajan in A.D. 101, but in A.D. 274, in the reign of Aurelian, had to be abandoned by the Roman colonists.

Dace

DACIER (dä-syā), **André.** A learned Frenchman, born 1651. He studied at Saumur, and in 1672 he went to Paris, where the Duc de Montausier entrusted him with the editing of the Latin writer Pompeius Festus *ad usum Delphini* (*see* DELPHIN CLASSICS). In 1683 he married Anne Lefèvre, the daughter of his former teacher, afterwards became perpetual secretary of the French Academy, published many editions and translations of the ancient classics, and died in 1722.

DACIER, Anne. Wife of the preceding, born in 1651, died in 1720. She published an edition of Callimachus, and was entrusted with several editions of the classics *ad usum Delphini*. Her learned works were not interrupted by her marriage in 1683. Her translation of Homer and writings on Homeric poetry attracted a good deal of attention. Amongst her other works were translations of Terence, Plautus, two plays of Aristophanes, Anacreon, and Sappho.

DACOI'TY. Originally, in the criminal code of India, a robbery committed by an armed band or gang, and technically under the present law of India any robbery in which five or more persons take a part. The term has also been applied more widely. Originally dacoity was rooted in religion and custom, robbery with violence in India being considered not only as an occupation and a hereditary profession, but a religious and caste duty. *See* THUGS.

DACRYD'IUM. A genus of trees of the pine or yew family. *See* RIMU.

DACRYO'MA. A term used to denote obstruction to the flow of tears down the lachrymal duct leading from the eye to the nose, with the result that the tears overflow (Epiphora). This obstruction may be due to some inflammatory process or to a small growth.

DACRYOMYCETINEÆ. A family of Basidiomycetes, characterized by the basidia bearing two very long sterigmata, so that the basidium is almost divided into two lengthwise, and by the fact that the spores divide before germination. The fruit-bodies are gelatinous or waxy. The red, slimy patches often seen on damp palings are the fructifications of *Dacryomyces deliquescens*. Various species of Calocera are the "candle-tufts," found on tree-stumps, resembling small Clavarias in form, and generally of a beautiful orange or yellow colour.

DA'DO. In classical architecture, the middle part of a pedestal, that is to say, the solid rectangular part between the plinth and the cornice; also called the *die*. In the interior of houses it is applied to a skirting of wood several feet high round the lower part of the walls, or an imitation of this by paper or painting.

DÆ'DALUS (Gr. *Daidalos*, literally the "cunning worker"). A mythical Greek architect and sculptor, the scene of most of whose labours is placed in Crete. He is said to have lived three generations before the Trojan War. He built the famous labyrinth in Crete, and invented wings for flight, which his son Icarus foolishly attempted to use, and was drowned in the Icarian Sea. Dædalus himself escaped to Italy, where he built the temple of Apollo at Cumæ.

DAFF'ODIL. The popular name of a British plant which is one of the earliest ornaments of cottage gardens in England, as well as of woods and meadows, *Narcissus Pseudo-Narcissus* ord. Amaryllidaceæ. Many

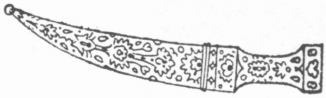
Daffodil

varieties of the daffodil are in cultivation, differing chiefly in bulk and in the form of the flower, which is of a bright primrose-yellow colour.

DAGENHAM. Urban district of Essex. It is 3 miles from Barking and 11 from London, on the north side of the Thames, and includes Becontree. Here are the English works of the Ford Motor Co. begun in 1928, and docks. Pop. (1931) 89,365.

DAGESTAN'. A republic of Russia, in the Caucasus, stretching along the west side of the Caspian Sea; area, 22,000 sq. miles. Its fertile and tolerably cultivated valleys produce good crops of grain, and also silk, cotton, flax, and tobacco. The inhabitants, almost all professed Mohammedans, consist chiefly of races of Tartar origin and of Circassians. The capital is Makhach-Kala. Pop. 788,000.

DAGGER. A weapon resembling a short sword, with sharp-pointed blade. In single combat it was wielded in the left hand and used to parry the adversary's blow, and also to dispatch him when vanquished.



Dagger

The *poniard* and *stiletto* are daggers, as is also the Indian *khuttar*.

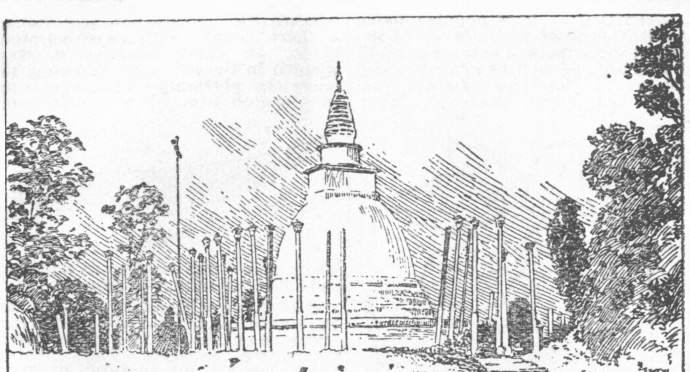
DAGO. An island of Estonia, in the Baltic Sea, to the south-west of the entrance of the Gulf of Finland, with productive fisheries. The inhabitants, almost all Swedes, number about 15,000. The island was occupied by the Germans on 20th Oct., 1917. Area, 367 sq. miles.

DAGO. Originally the name given by sailors to Spaniards, Portuguese, and Italians. It is now a slang term applied in America to lower-class Italian immigrants. It is probably a corruption of the Sp. *Diego*, a Christian name equivalent to "James."

DA'GOBA. In Buddhist countries and those which at one time held the Buddhist faith, a solid structure erected to contain some sacred relic or relics, as distinguished from the term *stupa* or *tope*, which in its specific application is usually restricted to monuments which commemorate some event or mark some spot sacred to the followers of Buddha. Dagobas are built of brick or stone, are circular in form, generally with a dome-shaped top, and are erected on natural or artificial mounds, while the stone or brick structure itself sometimes rises to an immense height. These dagobas have always been held in the highest veneration by the Buddhists, and a common mode of testifying their veneration is to walk round them, repeating prayers the while.

DAG'OBERT I. (called the *Great* on account of his military successes), King of the Franks, in 628 succeeded his father, Clothaire II. After a successful, magnificent, but licentious reign, he died at Epinay in 639.

DA'GON (probably from the Heb. *dag*, a fish). The god of the Philistines, whose image is generally believed to have been in the form of a triton or merman, with the upper part human and the extremities, from the waist downwards, in the shape of the tail of a fish. The name may, however, have



Dagoba, Thuparamaya, 307 B.C.

been derived from the Heb. *dāgān*, corn, and some scholars, therefore, consider Dagon to have been an agricultural deity.

DAGUERRE (dă-gār), **Louis Jacques Mandé.** Was born in 1789 at Cormeilles, department of Seine-et-Oise, died 10th July, 1851. He was a scene-painter at Paris, and as early as 1814 had his attention directed by Nicéphore Nièpce to the subject of photographic pictures on metal. In 1829 they made a formal agreement to work out the invention together, but it was not till after Nièpce's death, on 5th July, 1833, that Daguerre succeeded in perfecting the process since called *daguerreotype*. The new process excited the greatest interest. Daguerre was made an officer of the Legion of Honour, and an annuity of 6000 francs was settled on him, and one of 4000 on the son of Nièpce.

DAGUERREOTYPE PROCESS (dager'ro-tip). The original photographic process, consisting in sensitising a silver plate with the vapour of iodine, exposing it to the light in the camera obscura, and afterwards developing the picture by vapour of mercury. It is then fixed by immersion in hyposulphite of sodium. After thorough washing and drying, the picture is covered with glass to prevent its being rubbed off. Daguerreotype has long been superseded by other processes.

DAHABIYEH, or DAHABEAH (dä-hä-bē'e; Arab. *dhahaba*, to go). A boat used on the Nile for conveyance of travellers. It varies considerably in size; has one or two masts, with a very long slanting yard on each mast supporting a triangular sail, and accommodates from two to eight passengers.

DAHL, Vladimir Ivanovitsh. Russian lexicographer, born 1801, died 1872. He studied medicine, but soon turned his attention to literature, coming into intimate contact with Pushkin, Krylov, and Gogol. His most important work is his *Dictionary of Existing Russian Dialects* (4 vols.).

DAHLAK. *See* DHALAK.

DAHLGREN (däl'gren) **GUNS.** An improved kind of smooth-bore cannon invented by John A. Dahlgren, Admiral of the United States navy, born 1809, died 1870, chiefly peculiar in having less metal between the muzzle and the trunnions than other guns. These guns were colloquially known as "soda-water bottles," and were used in the American Civil War. They are now quite obsolete.

DAH'LIA (so called after the Swedish botanist Dahl). A genus of plants belonging to the nat. ord. Compositæ, natives of Mexico. By cultivation an immense number of varieties have been produced, all deriving their origin from *D. coccinea* and *D. variabilis*. It was introduced into Europe in 1789. It does not stand frost, and has to be taken up during winter.

Dahlia

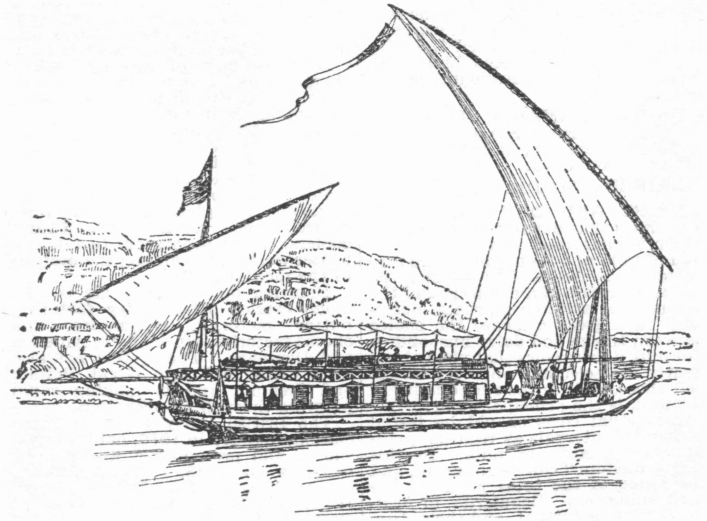
DAHLMANN (däl'mân), **Friedrich Christoph.** A distinguished historian of Germany, born 1785, died 1860. He was professor at Göttingen and afterwards at Bonn, and distinguished himself as an advocate of liberal measures in politics. His principal work is a *History of the English Revolution* (1844).

DAHN, Julius Sophus Felix. German novelist and historian, born at Hamburg in 1834, died in 1912. In 1872 he became professor of jurisprudence at the University of Königsberg, and from 1888 he occupied the same position at the University of Breslau, where he became rector in 1895. His works include the novels *Ein Kampf um Rom* (The Struggle for Rome, 1876), *Odhin's Trost* (1888); and numerous historical and juridical works.

DAHO'MEY. A French possession in West Africa, formerly a negro kingdom, notorious for the savagery of its inhabitants, and especially for the human sacrifices or "customs" offered up by the king. It lies between Togoland on the west, and the British territories of Lagos and Nigeria on the east, and extends inland for about 130 miles, with a breadth of about 70 miles. It is well wooded and watered, and very fertile. The cultivation of cotton has been successfully introduced.

The chief exports are maize, palm-oil, copra. The king used to keep up an army of 10,000, a number being women. The seat of government is Porto Novo; the chief port, Whydah.

History.—In 1890 the king granted France a protectorate over the coast. A year or two after, hostilities broke out with the French, who defeated



Dahabiyeh

the king and annexed Dahomey in 1894.

Pop. (1931), 1,134,247, including 1047 Europeans. The area is 41,302 sq. miles.—Cf. Herissé, *L'Ancien royaume de Dahomey*.

DAIL EIREANN. House of the legislature of the Irish Free State. The name was given by Sinn Fein members of parliament to the assembly they set up in Dublin in 1919. When the Irish Free State was created by treaty in 1922 the name was given to the Chamber of Deputies which, with the Seanad Eireann, or Senate, constitutes the state legislature. It has a speaker, deputy speaker, and clerk of the House. It consists of 153 members, elected by the constituencies of the Free State.

DAIMIEL (dī-mē-el'). A town, Spain, New Castile, province of Ciudad Real, and 20 miles from the town of Ciudad Real, on the left bank of the Azuer. The manufactures are linen and woollen fabrics. Pop. 16,260.

DAIMIOS (dī'mi-ōz). A class of feudal lords formerly existing in Japan, but now deprived of their privileges and jurisdiction. By decree of August, 1871, the daimios were made official governors on a salary for the state in the districts which they had previously held as feudal rulers.

DAIMLER, Gottlieb. German engineer, born in 1834, died in 1900. He came to England, where he was employed at the Whitworth works at Manchester. He perfected the Otto gas engine, and devoted himself to experiments with petroleum motors and oil engines.

DAIR-EL-KAMAR. The chief town of the Druses, Syria, on a slope of Mount Lebanon, 12 miles S.E. of Beirut. Pop. 8000.

DAIREN. *See* DALNY.

DAIRY AND DAIRY-FARMING. A dairy is that department of a farm which is concerned with the production of milk and its manufacture into butter and cheese. As a rule, the soil and climate of a country, and the nearness of suitable markets, determine in a great measure the choice between tillage and dairy husbandry. For milk dairies cows that yield abundantly are selected, while for butter and cheese dairies the rich quality of the milk is the principal point.

Individual cows should be tested at regular intervals as regards quantity and quality of milk. In this way "wasters" can be got rid of, and the value of the total yield for the herd enhanced. Regularity in feeding is very important, and the nature of the food given has a great effect on the quality of the milk. The younger the cow is the richer is her milk, and the second and third years, therefore, are generally the most profitable, both quantity and quality being taken into account. In general, after the seventh or eighth year it is not considered advisable to continue the cow longer in milk, as her milk is fast deteriorating and she consumes more food than a young one. In Great Britain the cattle of Ayrshire and Jersey hold the first place for dairy purposes, the first on account of the large yield which they give on comparatively poor feeding, the second for the richness of their milk.

In the management of a dairy cleanliness is of the utmost importance, as no substance more easily receives and retains the odours and taste of putrescent matter than milk. No food, either vegetable or animal, should be allowed to enter the milk-house. A good mode of purifying the atmosphere of a milk-house is to dip cloths in a solution of chloride of lime and then hang them up on cords stretching from one corner to the other. In a similar way, too, the temperature of the room may be kept low during hot weather. The milk-room, therefore, should be built in such a manner as to be most easily cleaned and kept clean. The floor should be of smooth flagstones carefully jointed and dressed. It should have a slight slope towards the wall, where a channel is formed to convey all water and spilt liquid to a drain. All cornices and mouldings, or any projections or cavities where dust or dirt can lodge, should be as far as possible avoided.

Spilt milk should never be allowed to remain an instant longer than is necessary for its removal. The liberal use of pure, clean water (cold or hot as required) is essential; and the milk-dishes should be steamed or scalded. The best dishes for milk are made either of glass, tin, tinned-iron, or well-glazed earthenware. Cream coolers, cream separators (q.v.), and butter workers are among the utensils of the modern dairy.

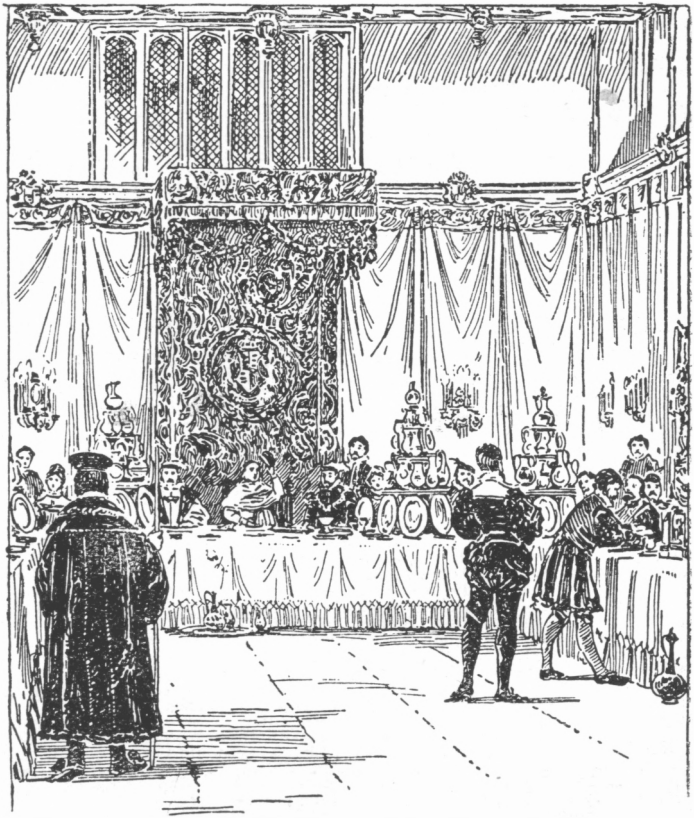
Dairying on a large scale is now much carried on in dairy factories, butter factories, creameries, and cheese factories, especially in America and Denmark. The system has also been introduced into Great Britain and Ireland, and is making rapid progress through co-operation.

The British Dairy Farmers' Association, founded in 1876, holds annual shows, and promoted a world dairy congress in 1928. Its Aylesbury school became the British Dairy Institute which, with the National Dairy Research Institute, is associated with Reading University. There

are now schools all over the country which provide technical instruction in dairy-farming. Dairy science studies the physiology of milk secretion, bacterial organisms, the food value of forage plants, and the improvement of cattle. *See* BUTTER; CHEESE.—BIBLIOGRAPHY: C. B. Lane, *The Business of Dairying*; C. H. Eccles, *Dairy Cattle and Milk Production*; G. S. Thomson, *British and Colonial Dairying*; J. P. Sheldon, *Dairying*; R. M. Washburn, *Productive Dairying*; W. A. G. Penlington, *Science of Dairying*.

DAIS. A platform or raised floor at the upper end of an ancient dining-hall, where the high table stood; also a seat with a high wainscot back, and sometimes with a canopy, for those who sat at the high table. The word is also sometimes applied to the high table itself.

DAISY. The name of a plant which is very familiar, and a great favourite in Europe (*Bellis perennis*). It never ceases to flower, is found in all pastures and meadows, and ascends nearly to the summit of the highest mountains in Britain. Its name is literally *day's eye*, being given because it opens and closes its flower with the daylight. The Swiss formerly employed an infusion of the leaves in water or goat's milk against hectic fevers.



Dais. Hampton Court in the time of Wolsey

DÂK, or DAWK. In the East Indies, the post; a relay of men for carrying letters, dispatches, or travellers in palanquins. The route is divided into stages, and each bearer, or set of bearers, serves only for a single stage. —A **dak-bungalow** is a house at the end of a stage designed for those who journey by palanquin.

DAKAR'. A fortified French naval station in Senegal, West Africa, on the small peninsula of Cape Verde, connected by railway with St. Louis, at the mouth of the Senegal. It is the seat of the Government General. Dakar and its suburbs were formed into a special territory in 1924. Pop. (1931), 53,982; white, 6559.

DAKO'TA, North and South. Two of the United States, divided along the 46th parallel, previous to 1889 forming the territory of Dakota, but then proclaimed as separate states.

North Dakota is bounded on the north by Assiniboia and Manitoba in the Dominion of Canada, east by Minnesota, south by South Dakota, and west by Montana. A plain or plateau, the Coteau du Missouri, traverses the state from north-west to south-east. The Missouri flows across the state south-eastward, other rivers being the Red River, Souris, Little Missouri, and James River. There are numerous lakes, the largest of which is called Devil's Lake or Minnewaukan. Part of the state is occupied by Indian Reservations. The greater part is suitable for agriculture, and excellent wheat is grown. There are over 5000 miles of steam-railway, including the North Pacific line. Area, 70,837 sq. miles; pop. 680,845 (1930). Bismarck is the capital.

South Dakota is bounded on the west by Montana and Wyoming, east by Minnesota and Iowa, north by North Dakota, and south by Nebraska. The greater part of this state is prairie, and some of it is timbered. The Black Hills in the south-west yield gold and silver, while tin, antimony, lead, copper, and other minerals are also found. The Missouri traverses the state and partly bounds it, and other rivers are the White, Grand, Big Cheyenne, Moreau, James or Dakota, and Big Sioux. Maize, flax, etc., are cultivated. A considerable portion of the state is occupied by the Sioux Reservation. Pierre is the capital.

In winter the cold in the two Dakotas is severe, but the atmosphere is dry, and in summer the climate is pleasant. The planting of timber has been greatly encouraged. There are numerous schools and colleges, and education is entirely free. There are 4000 miles of railway. Area, 77,615 sq. miles; pop. 692,849 (1930).—BIBLIOGRAPHY: Lounsberry, *Early History of North Dakota*; F. L. Ransom, *The Sunshine State*.

DAKOTA INDIANS. *See* SIOUX.

DALAI LAMA. *See* LAMAISM.

DALBEATTIE (dal-bē'ti). A burgh in Kirkcudbrightshire, Scotland, with paper and other mills, granite quarries, granite-polishing works, and concrete works in the neighbourhood. Pop. (1931), 3011.

DALBER'GIA. A genus of fine tropical forest trees and climbing shrubs, nat. ord. Leguminosæ, some species of which yield excellent timber *D. latifolia* (the black-wood, or East Indian rosewood) is a magnificent tree, furnishing one of the most valuable furniture woods. *D. Sissoo* gives a hard durable wood, called sissoo, much employed in India for railway-sleepers, house-building, and ship-building.

DALECAR'LIA, or DALARNE. A tract in Sweden. The name, meaning "valley-land," is kept alive in the minds of the inhabitants by the noble struggles which the Dalecarlians, its inhabitants, made to establish and maintain the independence of the country, especially from 1519 to 1523, under Gustavus Vasa.

DALEN, Nils Gustav, Swedish engineer and expert on gas lighting, born in 1869. Educated at Gothenburg and Zurich, he invented a method of automatic lighting for unmanned lighthouses, and for railway signals. He also made various improvements in air-compressors and hot air turbines. He was awarded the Nobel prize for physics in 1912, and became a member of the Royal Swedish Academy of Science in 1913.

DALGAR'NO, George. Born at Aberdeen about 1627, took up his residence at Oxford, where he taught a private grammar-school for about thirty years, and where he died 28th Aug., 1687. He was a man of great originality and acquirement, and left behind him two remarkable works, *Ars Signorum*, an essay on a universal or philosophical language, and *Didascalocophus, or The Deaf and Dumb Man's Tutor*.

DALHOUSIE (dal-hä'zi), **Fox Maule Ramsay, Eleventh Earl of.** Born 1801, died 1874. He served some years in the army, and was member of Parliament for the burghs of Elgin and Perth. He became Baron Panmure on the death of his father in 1852; was Secretary for War from 1855 to 1858, when he retired from political life. In 1860, on the death

of his cousin, he succeeded to the title of Earl of Dalhousie. He had no family, and was succeeded by his cousin, George Ramsay, twelfth earl.

DALHOUSIE, James Andrew Brown Ramsay, Tenth Earl and First Marquess of. British statesman, born in 1812, died 19th Dec., 1860. He was educated at Harrow and at Christ Church, Oxford, and, after filling the offices of Vice-President (1843) and President of the Board of Trade (1844), he was appointed Governor-General of India (1847). In this post he showed high administrative talent, establishing railway lines, telegraphs, and irrigation works on a vast scale. He greatly extended the British Empire in India, annexing the Punjab, Oude, Berar, and other native states, as well as Pegu in Burmah. In 1849 he was made a marquess and obtained the thanks of both Houses of Parliament.

He outstayed his term of office to give the Government the aid of his experience in the annexation of Oude; and when he returned to Europe in 1856 it was with a constitution so completely shattered that he was never able to appear again in public life. As he left no direct male issue, his marquessate expired with him.—BIBLIOGRAPHY: Captain L. J. Trotter, *Life of Dalhousie* (in Statesmen Series); E. Gilliat, *Lord Dalhousie: a Masterful Ruler* (Heroes of Modern India); Sir W. Lee-Warner, *Life of the Marquess of Dalhousie, K.T.*

DALIAS'. A town of Spain, province of Almeria, near the coast. Pop. 7250.

DALKEITH (dal-kēth'). A burgh of Scotland, in the county of and 6 miles S.S.E. of Edinburgh. Iron-founding, carpet-weaving, and brush-making are among the industries. It has an important corn market. Here is one of the principal seats of the Duke of Buccleuch, Dalkeith Palace, built on the site of a castle for ages the chief seat of the ancient family of Morton. Pop. (1931), 7502.

DALLAS. A city of the United States, in Texas, on the Trinity River, a well-built and flourishing place, and an important railroad centre. Pop. 158,976.

DALLES (dalz). The name given to various rapids and cataracts in North America. The *Great Dalles of the Columbia* are about 200 miles from its mouth, where the river is compressed by lofty basaltic rocks into a roaring torrent about 58 yards in width; the *Dalles of the St. Louis* are a series of cataracts near Duluth, Minnesota. The Dalles and Celilo Canal has been recently completed.

DALMA'TIA. Until 1919 a province of Austria, with the title of kingdom, the most southern portion of the Austrian dominions, now belonging to Yugoslavia, with the exception of Zara, which belongs to Italy. It consists of a long narrow triangular tract of mountainous country and a number of large islands along the north-east coast of the Adriatic Sea, and bounded north by Croatia, and north-east by Bosnia and Hercegovina. Its whole area is 4916 English sq. miles, and its breadth at no point exceeds 40 miles.

Physical Features.—The inland parts of Dalmatia are mountainous, but though there are some rich and beautiful valleys, the country on the whole must be considered poor and unproductive. The Narenta, the Zermagna, the Kerka, and the Cettina are the principal rivers, all with short courses. On some of these the scenery is singularly wild and picturesque.

The interior is occupied by a much-neglected population, and agriculture is in a very backward state. Timber is scarce, and the country does not produce sufficient grain for its own wants. Apples, pears, peaches, apricots, oranges, and pomegranates are amongst the fruits; the wines are strong and sweet. On the coast fish, especially the tunny and the sardine, abound.

The trade of the country is mostly confined to the coast towns, where the population is mainly of Italian extraction. Chief of these are Zara (the capital), Sebenico, Cattaro, Spalato, and Ragusa.

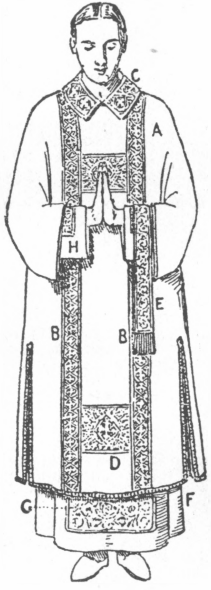
Amongst the numerous islands sprinkled along the coast many are valuable for their productions, such as timber, wine, oil, cheese, honey, salt, and asphalt. The inhabitants consist of the Italians of the coast towns and the peasants of the interior, Slovenian Slavs, speaking a dialect of the Slavonic. The majority are Roman Catholics.

History.—After passing successively through the hands of Hungarian and Venetian rulers, and of the first Napoleon, Dalmatia, in 1814, fell under Austrian rule. During the nineteenth and twentieth centuries there has been a considerable development of Croatian nationalism among the Dalmatians. When Italy joined the Allies in the European War, it was arranged that the northern half of Dalmatia should be ceded to Italy in the event of victory. After the Revolution in Austria-Hungary, Slovenia, Croatia, Dalmatia, and Bosnia declared their independence, and on 29th Dec., 1918, the first ministry of the kingdom of the Serbs, Croats, and Slovenes, or Yugoslavia, was formed.

In Dec., 1920, the Italian troops evacuated Dalmatia. Pop. 622,000. —BIBLIOGRAPHY: E. A. Freeman, *Subject and Neighbour Lands of Venice*; W. Royle, *Dalmatia Illustrata.*

DALMATIAN. Breed of dog. It is a lightly built pointer, perhaps with original bull terrier crossing, with unwrinkled head and smooth, glossy white coat with evenly sprinkled black spots. It averages 50-55 lb. in weight.

DALMAT'IC, or DALMATICA. An ecclesiastical vestment worn by the deacon at mass, so called because it



Deacon wearing Dalmatic

A, Dalmatic. B, B, Orphreys. C, Apparel of neck. D, Apparel of Dalmatic. E, Maniple. F, Alb. G, Apparel of alb. H, Sleeve of alb.

was an imitation of Dalmatian costume. It is worn also by bishops under the chasuble. It is a long robe with large full sleeves with black or red longitudinal stripes and partially open sides. A similar robe was worn by kings and emperors at high solemnities, and continues still to be worn by the sovereigns of England at their coronation.

DALMELLINGTON. Village of Ayrshire. It is situated on the River Doon, 15 miles from Ayr on the L.M.S. Railway. A Roman road once passed through the parish towards Ayr. Iron working and coal mining are the chief industries in the neighbourhood. Pop. 6151.

DALMENY. Village of Linlithgowshire. It is on the Forth, 10 miles from Edinburgh, on the L.N.E. Railway. There is an old church here and also Dalmeny House, the seat of the Earl of Rosebery, whose eldest son is called Lord Dalmeny. Pop. 3237.

DALNY (renamed **DAIREN** or **TAIREN**). A Japanese seaport in Manchuria, on the Liaotung Peninsula, near Port Arthur, connected with the Siberian Railway. Established as a port by Russia in 1901, and occupied by the Japanese under General Oku in 1904, became a free port in 1906. Pop. 220,588.

DALOU, Jules. Eminent French sculptor, born 1838, died 1902. After Rodin he is the most prominent figure in French sculpture of the later nineteenth century. His works include: *Maternity*, in front of the Royal Exchange, London; *Triumph of the Republic*; *Mirabeau answering Dreux Brézé*; and *Silenus*, in the Jardin du Luxembourg.

DAL'RIADA. The ancient name of a territory in Antrim, called after Carbry Riada, one of its chiefs. In the sixth century a band of Irish from this quarter settled in Argyllshire under Fergus MacErc, and founded the kingdom of the Scots of Dalriada. After being almost extinguished, the Dalriadic line revived in the ninth century with Kenneth Macalpine, and, seizing the Pictish throne, gave kings to the whole of Scotland.

DALRY'. A town of Scotland, county of Ayr, on the Garnock, 19 miles S.W. of Glasgow, with ironworks and woollen and worsted mills. Pop. (parish, 1931), 6827.

DALRYM'PLE, Sir David, Lord Hailes. A Scottish lawyer, antiquary, and historian, born at Edinburgh in 1726, died 29th Nov., 1792. He studied at Eton and Utrecht. In 1748 he was called to the Bar, and in 1766 was made a judge of the Court of Session. His publications were numerous, but consist principally of new editions and translations. Of his original productions, *The Annals of Scotland from Malcolm Canmore to the Accession of the House of Stuart* is the most important.

DALRYMPLE, James, First Viscount Stair. Scottish lawyer and statesman, born in 1619, died in 1695. In the Civil War he sided at first with the Parliament, but afterwards with the Royalists; was made a knight

soon after the Restoration, and in 1671 President of the Court of Session. In 1682 he fell out of favour with the king, and retiring to Holland became an adherent of the Prince of Orange, who, after the Revolution, raised him to the peerage. The connection of his son, the Master of Stair, with the massacre of Glencoe brought some odium upon him in his last years. He wrote: *The Institutes of the Laws of Scotland, Vindication of the Divine Perfections*, and *An Apology for his Own Conduct*.

DALRYMPLE, John, First Earl of Stair. Born 1648, died 1707, son of the preceding, was an able Scottish lawyer and statesman. It was through him that the massacre of Glencoe was perpetrated in 1692. He succeeded his father as viscount in 1695, and in 1703 was created earl. He was largely instrumental in bringing about the union between Scotland and England.

DALRYMPLE, John, Second Earl of Stair. Born at Edinburgh in 1673, died there in 1747. He studied at Leyden University, entered a Cameronian regiment in 1692, was aide-de-camp to Marlborough in 1702, and distinguished himself at Oudenarde, Malplaquet, and Ramillies. In 1707 he succeeded to the earldom of Stair, and from 1715 to 1720 was in France on a diplomatic mission, in which he showed great ability. After twenty years' retirement from public life, in which he did much to improve the agriculture of Scotland, in 1742 he accepted the command of the troops sent to the Continent, and was present at the battle of Dettingen, 1743.—Cf. J. Murray Graham, *Annals and Correspondence of the Viscount and First and Second Earls of Stair*.

DAL SEGNO (sen'yō; It.), often contracted into *D.S.*, means "from the sign." In music this expression denotes that the singer or player ought to recommence at the place where the sign 𝄋 is put.

DALTON, John. An English chemist and natural philosopher, born in 1766, died 27th July, 1844. After teaching for twelve years at Kendal, in 1793 his reputation as a mathematician was established, and he was appointed to the chair of mathematics at the New College, Manchester. Here he continued to reside (though the college was removed to York in 1799), publishing from year to year valuable essays and papers on scientific subjects, while he also lectured in London, and visited Paris.

In 1808 he announced (*New System of Chemical Philosophy*) his atomic theory of chemical action, the discovery of which spread his fame over Europe. Various academic and other honours were bestowed upon him, and in 1833 he received a pension of £150, afterwards increased to £300. A bust of him, by Chantrey, is in the Royal Institution, Manchester.

DALTON-IN-FURNESS. A town of England, in the county of Lancaster. In its vicinity are extensive ironworks and the ruins of the Cistercian abbey of Furness. Pop. (1931), 10,338.

DALTON PLAN. *See* EDUCATION.

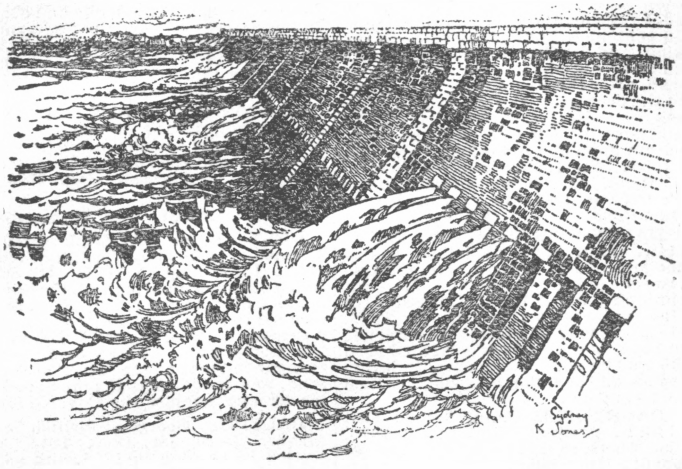
DALYELL, or **DALZELL** (di-el'), **Thomas.** A Scottish soldier, born about 1599, died in 1685. He was taken prisoner fighting on the Royalist side at Worcester, and afterwards escaped to Russia, where he was made a general. Returning to England at the Restoration, he was made commander-in-chief of the forces in Scotland, and made himself notorious by his ferocity against the Covenanters.

DALZIEL, George. British engraver. Born 1st Dec., 1815, he settled in London in 1835, and with his brothers started in business as an engraver. They provided the woodcut illustrations for an edition of *The Waverley Novels*, and did a great deal of work for *Punch*, *The Illustrated London News*, *The Cornhill Magazine* and other periodicals. Later Dalziel became a publisher. He died 4th Aug., 1902.

DAM. Term applied to an embankment or barrier of wood or masonry built across a river or lake. It serves to prevent or regulate the flow of water for purposes of irrigation, or for providing water power for generating electricity. Notable dams are those on the Nile at Assuan, Esna, Nag' Hammâdi, Zifta, and Asyut; the Great Sennar dam in the Sudan, the Hindiyah barrage across the Euphrates in Iraq, the Lloyd dam in India, the Bassano dam over the Bow River, Alberta, Canada, and Lake Vyrnwy dam, North Wales. Much greater than the Sennar dam is the Hoover dam which is being constructed at Black Canyon on the Colorado. *See* ASSUAN DAM; EMBANKMENT; GEZIRA; RESERVOIR. —Cf. J. Husband and W. Harby, *Structural Engineering*.

DAMAGE-FEASANT. In law, doing injury; trespassing, as cattle: applied to a stranger's beasts found in another person's ground, and there doing damage.

DAM'AGES. In law, pecuniary compensation paid to a person for loss or injury sustained by him through the fault of another. It is not necessary that the act should



The Great Dam on the Nile, Assuan

have been a fraudulent one; it is enough that it be illegal, unwarrantable, or malicious. If, however, a person has suffered a loss through fraud or delict on the part of another, that person has not only a claim to ordinary damages, but may also claim remote or consequential damages, and may estimate the amount of the loss he has sustained not at its real value, but at the imaginary value which he himself may put upon it, subject, however, to the modification of a judge or a jury. In other cases the damages cover only the loss sustained estimated at its real value, together with the expenses incurred in obtaining damages. BIBLIOGRAPHY: J. D. Mayne, *Treatise on the Law of Damages*; F. O. Arnold, *The Law of Damages and Compensation*.

DAMAN (*da-măn'*). A seaport, India, at the mouth of the Gulf of Cambay, 100 miles north of Bombay. It belongs to the Portuguese, who conquered it in 1531, and made it a permanent settlement in 1558. It formerly had a large trade, but this has much declined. The settlement, Duman or Damão, which is in the province of Gujarat, has an area of 150 sq. miles; pop. 68,720.

DAMANHŪR'. A town of Egypt, capital of the province of Bahreh, 38 miles E.S.E. of Alexandria. It was the ancient "City of Horus," and known as Hermopolis Parva. It has manufactures of cotton and wool. Pop. (1927), 51,709.

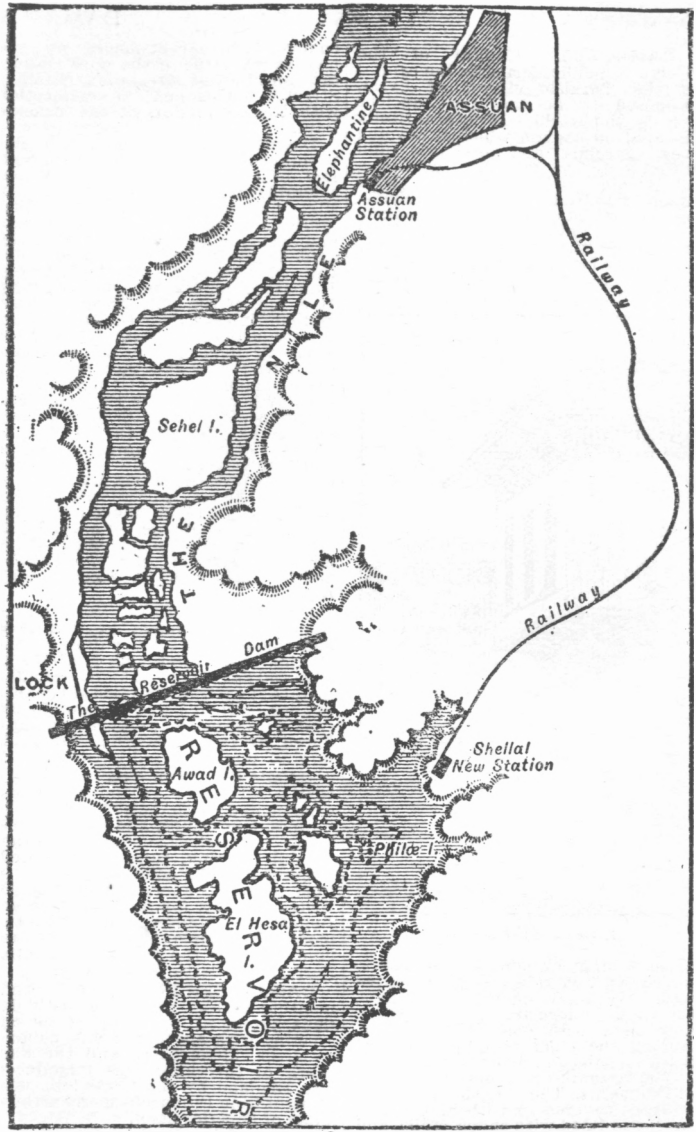
DAMAR', or DEMAR'. A town, Arabia, Yemen, 120 miles north by west of Aden. Pop. about 20,000.

DAMAR. *See* DAMMAR.

DAM'ARALAND. Formerly a portion of the German territory in South-West Africa, now mandated to the Union of South Africa, extending from the Atlantic coast inland to 20° E. long. Area about 100,000 sq. miles, including a large amount of barren lands. Its port is Walvis Bay. *See* SOUTH-WEST AFRICA.

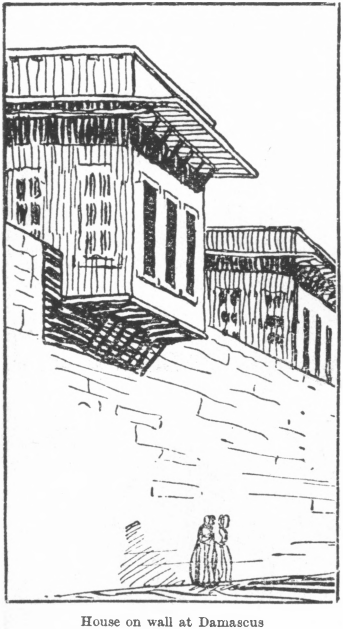
DAMASCENING. Term applied to several processes for ornamenting metallic surfaces. The pattern may be deeply engraved with undercut grooves filled with gold or silver thread, and smoothed. Such work, highly developed in the East, was introduced by the Crusaders to Western Europe.

DAMASCE'NUS, John. John of Damascus, afterwards called also John *Chrysorrhoas* ("golden stream"), was born at Damascus about A.D. 676, died about 760. He was the author of the first system of Christian theology in the Eastern Church, or the founder of scientific dogmatics, and his exposition of the orthodox faith enjoyed in the Greek Church a great reputation. He is supposed to be the author of the famous religious romance *Barlaam and Josaphat* (q.v.), a Christianized version of the legend of Buddha.



MAP SHOWING POSITION OF THE ASSUAN BARRAGE

DAMAS'CUS. Capital of the Syrian Republic, formerly the capital of the Turkish vilayet of Syria, supposed to be the most ancient city in the world. It is beautifully situated on a plain which is covered with gardens and orchards and watered by the Barrada. The city, as it appears at first, has been much admired by all travellers; but the streets are narrow, crooked, and in parts dilapidated, and, except in the wealthy Moslem quarter, the houses are low, with flat-arched doors and accumulations of filth before the entrance. Within, however, there is often a singular contrast, in courts paved with marble and ornamented with trees and spouting fountains, the rooms adorned with arabesques and filled with splendid furniture. Among the chief buildings are the Serai or palace and the Citadel.



House on wall at Damascus

The bazaars are a notable feature of Damascus. They are simply streets or lanes covered in with high woodwork and lined with shops, stalls, and cafés. In the midst of the bazaars stands the Great Khan, it and thirty inferior khans being used as exchanges or market-places by the merchants. One of the most important and busiest streets is "Straight Street," mentioned in connection with the conversion of the Apostle Paul.

Damascus is an important emporium of trade in European manufactures; it is also a place of considerable manufacturing industry in silk, damasks, cotton and other fabrics, tobacco, glass, and soap. Saddles, fine cabinet-work and elegant jewellery are well made; but the manufacture of the famous Damascus blades no longer exists. It is one of the holy Moslem cities, and continues to be the most thoroughly Oriental in its features of any. Of its origin nothing certain is known; but it is mentioned as a place of some note in Gen. xiv. 15.

After being held by the Israelites, Assyrians, Persians, Greeks, Romans, and Arabs, it passed in 1516 to the Turks. It now has waterworks, gas, and tramways, and railways connect it with Beirut, the Hauran, the Hejaz, etc. As the result of an insurrection in 1925 the French shelled the city and did much damage. Pop. 193,912. *See* SYRIA.—BIBLIOGRAPHY: Macintosh, *Damascus and its People*; article *Damascus* in *Encyclopædia Biblica*.

DAMASCUS-STEEL. A kind of steel originally made in Damascus and the East, greatly valued in the making of swords for its hardness of edge and flexibility. It is a laminated metal of pure iron and steel of peculiar quality, carbon being present in excess of ordinary proportions, produced by careful heating, laborious forging, doubling, and twisting.

DAM'ASK. The name given to textile fabrics of various materials, ornamented with raised figures of flowers, landscapes, and other forms, being the richest species of ornamental weaving, tapestry excepted. Damask is very commonly made in linen for table napery. The principal British centres for fine damasks are Belfast and Dunfermline, while the medium textures are made in Ireland, and in the counties of Fife, Forfar, and Perth in Scotland.

DAMASKEEN'ING. The ornamenting of iron and steel with designs produced by inlaying or encrusting with another metal, as gold or silver, by etching, and the like. Work of this kind was introduced into England by the Crusaders, who brought from Damascus many articles made of superior steel.

DAM'ASUS. The name of two Popes.—**Damasus I.** was born about 305, reigned 366-384. He was a

friend of St. Jerome, whom he led to undertake the improved Latin version of the Bible known as the *Vulgate*. **Damasus II.**, a Bavarian by birth, was Pope for 23 days in 1048.

DAMBUL'. A village of Ceylon, 70 miles north-east of Colombo. A colossal statue of Buddha, hewn out of the rock, is in one of the numerous large caves near the village.

DAME. A title of honour which, in the age of chivalry, distinguished high-born ladies from the wives of citizens and the commonalty. In England the wives or widows of baronets and knights are entitled to style themselves "Dame," though in practice they seldom do so, "Lady" being preferred. Dame is also the title of women upon whom the honour of the first and second class of the Order of the British Empire has been conferred. They style themselves G.B.E., Dame Grand Cross, and D.B.E., Dame Commander.

DAME'S-VIOLET, or **DAME-WORT.** The popular names of *Hesperis matronālis*, nat. ord. Cruciferæ, a British plant with a perennial root;

Dame's-Violet

the stems, from 2 to 3 feet high, are few or solitary, and the leaves are serrate. It flowers in May and June.

DAMIA'NA. A drug obtained from *Turnera aphrodisiaca*, and other plants of the family Turneraceæ, found in America, and said to have aphrodisiac and tonic properties.

DAMIEN, Father. Belgian missionary, born 3rd Jan., 1840, died 15th April, 1889. He entered the Church when eighteen years of age, and in 1863 went out as a missionary to the Pacific Islands. In 1873 he volunteered to look after the spiritual needs of a settlement of lepers on the Island of Molokai, and there he remained until his death, having been stricken with leprosy in 1885. R. L. Stevenson wrote a somewhat vitriolic tract in defence of Father Damien. It was entitled *An Open Letter to the Rev. Dr. Hyde*, Dr. Hyde being an unimportant Presbyterian minister whom it was hardly necessary to drag from obscurity into infamy.

DAMIENS (dă-mē-ăn). **Robert François.** Notorious for his attempt to assassinate Louis XV., was the son of a poor farmer, and born in 1715 in the village of Tieulloy. His sombre and obstinate disposition early obtained him the name of *Robert-le-Diable*. After enlisting as a soldier, he became a house-servant in various establishments in Paris, and, having robbed one of his masters, he had to save himself by flight. After spending some months in different cities, in 1756 he returned to Paris with a mind which seems to have become disordered.

On 5th Jan., 1757, as Louis XV. was getting into his carriage to return from Versailles to Trianon, he was stabbed by Damiens in the right side. The wound was of a trifling nature, and Damiens, who made no attempt to escape, declared he never intended to kill the king. Damiens was condemned, and torn in quarters by horses, 28th March, 1757, on the Place de Grève at Paris.

DAMIET'TA. A town of Egypt, on one of the principal branches of the Nile, about 6 miles from its mouth. It contains some fine mosques, bazaars, and marble baths. Alexandria has long diverted the great stream of commerce from Damietta, but the latter has still a considerable trade with the interior in fish and rice. The ancient town of Damietta stood about 5 miles nearer the sea, but was razed in the thirteenth century, and the existing town was erected about 1260. Pop. (1927), 34,907.

DAM'MAR or **DAM'MARA PINE.** A genus of trees of the nat. ord. Coniferæ, distinguished by their large lanceolate leathery leaves, and by

their seeds having a wing on one side instead of proceeding from the end. The *Agathis orientālis* is a lofty tree of the East India Archipelago, attaining on some of the Molucca Islands a height of from 80 to 100 feet. It yields Manila copal or dammar resin. The Kauri pine, or *Agathis austrālis*, found in the North Island of New Zealand, is a magnificent tree, rising to a height of 150 to 160 feet, and yielding kauri-gum or copal.

DAMMAR RESIN. A gum or resin of several kinds produced by different trees. The East Indian or cat's-eye resin is got from the *Agathis orientālis*, a tree of the East Indian Islands, and is used for making varnishes for coach-builders and painters. In its native localities it is burned as incense, and is also used for caulking ships. *Sal* dammar is produced by the sal tree of India (*Shorèa robusta*), *rock* dammar by *Hopèa odorāta* and other species of trees; both yield good varnishes. *Black* dammar is another Indian species.

DAMMOO'DA. A river of India, Presidency of Bengal, which enters the Hooghly near its mouth; length, 350 miles.

DAM'OCLES. A native of Syracuse, and one of the courtiers and flatterers of the tyrant Dionysius the elder. One day he was extolling the grandeur and happiness of Dionysius, whereupon the latter invited him to a magnificent banquet, where he would be regaled with regal fare and regal honours. In the midst of the entertainment, however, Damocles happened to look upwards, and perceived with dismay a naked sword suspended over his head by a single hair, and was thus taught to form a better estimate of royal honours. Cf. Horace, *Odes*, iii. 1, 17.

DAMON AND PHINTIAS. Two illustrious Syracusans, celebrated as models of constant friendship. Phintius had been unjustly condemned to death by Dionysius the younger, tyrant of Sicily; but, having to leave Syracuse to arrange his affairs, his friend Damon was taken as a pledge that Phintias should return on the day fixed. Phintias, however, being unexpectedly detained, had great difficulty in reaching Syracuse in time to save Damon being executed in his place, and Dionysius was so affected by this proof of their friendship that he pardoned Phintias.

DAMPERS. Certain movable parts in the internal frame of a pianoforte, which, whenever the finger leaves the key, descend upon the wires and instantly check the vibration.

Dampers in a kitchen range are the sliding plates used to regulate the draught of flues and consequently the rate of combustion.

DAM'PIER, William. English navigator, born in 1652, died in 1715. He was descended from a good family in Somersetshire. He was sent to sea, and soon proved himself an able sailor. After serving in the Dutch War, in the Bay of Campeachy as a logwood-cutter, in a band of privateers on the Peruvian coasts, in a Virginian expedition against the Spanish settlements in the South Seas, and other enterprises of a similar nature, he returned home in 1691. In 1697 he published his *Voyage Round the World*, which became very popular, and next year he was appointed commander of a royal sloop-of-war, fitted out for a voyage of discovery in the Australian seas. The vessel, on the home voyage (1700), foundered off the Isle of Ascension, and Dampier returned to England.

In 1703 he sailed for the South Seas in command of a privateer, returning in 1707; and next year he shipped as pilot with Captain Woodes Rogers, and accompanied him on his voyage round the world. Besides the book mentioned, he wrote *Voyages and Descriptions*, a supplement to it, and *Voyage to New Holland*. He was an excellent hydrographer, and a keen observer.

DAMPING-OFF DISEASE, of plants. A fatal disease of young seedlings, especially of "mustard and cress," due to a parasitic Fungus, *Pythium debaryanum*, one of the Oomycetes. The spores of this Fungus are present in ordinary garden soil, and if seedlings are crowded and kept too damp, they are very liable to be attacked. Infected plants collapse, and soon die and become putrid. The Fungus spreads rapidly by means of conidia and zoopores while living hosts are available; it can exist for some time saprophytically on the dead remains of its victims, and finally produces, by a sexual process, resting spores, which lie in the soil ready to infect a fresh crop of seedlings.

DAMPS. Noxious exhalations which, issuing from the earth, are often deleterious, or even fatal, to animal life. Damps frequently exist in wells which have been long covered and disused, and sometimes issue from the old lavas of volcanoes. They are especially dangerous in mines and coal-pits. Miners distinguish such damps under the names of *choke-* or *after-damp*, consisting chiefly of carbonic acid gas, which instantly suffocates; *white-damp*,

containing carbon monoxide; and *fire-damp*, largely composed of marsh gas (methane), which readily explodes.

DAM'SON. A variety of the common plum (*Prunus domestica*). The fruit is rather small and oval, and its numerous sub-varieties are of different colours: black, bluish, dark-purple, and yellow. It is highly esteemed

Damson

for culinary use in a variety of ways, particularly the confection known as damson cheese. The damson (corruption of Damascene), as its name imports, is from Damascus.

DAN (Heb., meaning "judgment"). One of the sons of Jacob by his concubine Bilhah. At the time of the exodus the Danites numbered 62,700 men, being then the second tribe in point of numbers. The territory assigned them in Canaan lay on the coast, in the immediate neighbourhood of the hardy and well-equipped Philistines, and the Danites were pushed back into a more mountainous region. The tribe also possessed an isolated portion of territory in the extreme north of Canaan, containing the town of Laish or Dan, which gave rise to the proverbial expression "from Dan to Beersheba."

DA'NA, James Dwight. American naturalist, born 1813, and from 1850 a professor at Yale College. He wrote: *System of Mineralogy*, *Manual of Mineralogy*, *Coral Reefs and Islands*, *Manual of Geology*, *Textbook of Geology*, and many reports and papers. He died in 1895.

DANA, Richard Henry. American writer, born 1787 at Cambridge, in Massachusetts; educated at Harvard; published several collections of poems and two novels. He died in 1879.

DANA, Richard Henry. Son of the preceding, born 1815, died 1882. He was the author of the well-known work *Two Years before the Mast*, the result of his own experiences during a voyage recommended to him on account of his health.

DAN'AË. In Greek mythology, daughter of Acrisius, King of Argos. She was shut up by her father in a brazen tower, as there was a prophecy that her son would kill her father, but Zeus, who loved her, descended to her in a shower of gold. Set adrift on the waves by her father, she reached safely one of the Cyclades, where her child, Perseus, was brought up. Correggio, Rembrandt, and Titian have made the story of her union with Zeus the subject of famous paintings.

DANÆ'A. A genus of marattiaceous ferns, natives of tropical South America and W. Indies. The rhizome is woody and branched, and the leathery leaves are simple, ternate, or pinnate.

DANAÏDES. In Greek mythology, the fifty daughters of Danaus, the son of Belus and Anchinoë, who were all condemned with the exception of one (Hypermnestra) eternally to pour water into a vessel full of holes. This was their punishment for murdering their husbands, the forty-nine sons of Ægyptus, on their wedding night.

DAN'ANN DEITIES. The legendary history of Ireland refers to several intrusions of tribes in ancient times. At a time when the island was dominated by Fomorians, which in modern Gaelic means "giants," there arrived the Tuatha de Danann (pronounced too-a de dan'ann), the tribe of the goddess Danu, who became conquerors, and were subsequently subdued by the Milesians. Danu is a Great Mother goddess also called Ana or Anu. Her name is still preserved by the Kerry mountains known as the "Paps of Anu." The other deities were her children or descendants. The war-god Núada—"he of the silver hand"—was prominent. Dagda, who was connected with the oak and fire, was king of the gods. Diancecht, "the sage of leech-craft," provided salves for wounds; he was a god of healing. Manannan mac Lir was the sea-god, a "renowned trader,' a "weather prophet," and "the best pilot."

The goddesses are of special interest Nemon was the wife of Núada, and evidently the same as the Gaulish Nemetona, an earth and grove deity. Brigit, daughter of Dagda, was the same as the Celtic Brigantia. A group of three Brigits are: Brigit, goddess of poetry; Brigit, goddess of healing; and Brigit, goddess of smithwork. The chief goddess of another group of three was Mórrigu or Mórrigan, who links with Morgan le Fay of the Arthurian romances.

The name may be connected with the old Persian "margan" ("life giver") applied to the pearl, the symbol of Aphrodite and Hathor, the Egyptian cow- and sky-goddess. In the Cuchullin epic Morrigu appears as a raven or hoodie-crow, a heifer, an eel, and a grey wolf, and she visits Cuchullin leading a cow whose milk gives healing. The Danann love-god was Angus.

DAN'BURY. A town in Connecticut, about 53 miles N.N.E. of New York. It has notable manufactures of hats, shirts, and sewing-machines. Pop. 22,261.

DANBY, Francis. Painter, born near Wexford in 1793. He established his reputation by *The Upas Tree* (1820), and by his *Sunset at Sea after a Storm* (1823); and in 1825, by his *Delivery of Israel out of Egypt*, obtained the honour of being admitted as an associate of the Academy. Among his subsequent pictures the most celebrated are: *The Opening of the Sixth Seal*, exhibited in 1828; *The Age of Gold*, in 1831; *The Enchanted Island—Sunset*, in 1841; *The Contest of the Lyre and Pipe in the Vale of Tempe*, in 1842; and *The Painter's Holiday*, in 1844. Danby's excellence lay in his landscapes. He died in 1861.

DANCING. A rhythmic movement of the limbs and body, which in its simplest forms is probably coeval with human existence. Among primitive peoples it has served as an expression of strong emotion, whether of joy, sorrow, love, or, as exemplified by the war-dance of the Zulu warriors, lust of battle. The Bushmen of Africa, the Gonds of India, the Fijians, South Sea Islanders, and others, all have their dances; in many cases these are imitative in character, expressing in pantomime a great variety of everyday events and occupations.

Dancing enters largely into the religious ceremonial of many savage peoples, as formerly into that of the ancient Egyptians, Phrygians, Greeks, and Romans. The fact of David having danced before the Ark possibly accounted for the introduction of the practice in the early Christian Church, some fathers of that body even holding that the angels and Apostles danced in Paradise. Though soon generally condemned and abandoned, dancing is still practised at some festivals of the Church in Spain. It is now, however, viewed chiefly as an exercise and social amusement, and is almost invariably accompanied by music.

Our modern dancing may be regarded as dating from the fifteenth century renaissance of the art in Italy, thoroughly organized at a somewhat later period in France, which country, though possessing few, if any, national dances of its own, adopted and perfected those of other lands.

The dances of the French peasantry were of a light and lively character; those of the court and upper classes were extremely grave and dignified, the *pavane* being rather a procession than a dance. The later *saraband* was highly popular, while from the *courante* were derived the *minuet*, and, about 1770, the *waltz*, which is still a general favourite.

Dancing flourished exceedingly under Louis XIV., himself an industrious and accomplished performer. Kissing entered into the routine of many dances, a fact which doubtless increased the indignation with which dancing was regarded by the English Puritans.

The old English *Morris dance*, introduced to this country in the reign of Edward III., was properly the "Moorish" dance, derived through Spain, the true home of dancing. Among British national dances are the Scottish *reel* and *strathspey*, and the Irish *jig*; Wales being unrepresented by examples of the art.

American barn dances of negro origin, governed by jazz band syncopation, came to Europe and developed into the two-step, the one-step, and the fox trot. Stage dancing elaborated the latter, both French and Russian.

Viewed as an exercise, dancing is of the greatest value, and now enters largely into the curriculum of physical culture for the young. The *ballet*, originating in the fifteenth century in Italy, has been brought to perfection by Pavlova and other Russian performers. In the charming art of *skirt-dancing* the American Loie Fuller was for long supreme; while Maud Allan has had numerous imitators as an exponent of classical dancing. BIBLIOGRAPHY: L. de Cahousac, *La danse ancienne et moderne*; G. Vuillier, *History of Dancing*; J. E. C. Flitch, *Modern Dancing and Dancers*; T. and M. W. Kinney, *The Dance*; E. L. Urlin, *Dancing, Ancient and Modern.*

DANCING DISEASE, or **TARANTISM.** A dancing mania, seen in nervous disorders like hysteria and chorea. It appears to have been epidemic in Germany and Italy in the Middle Ages, when it was probably a manifestation of religious hysteria. There are records of epidemics in the seventeenth century, less widespread and more infrequent. It is now only seen in individual cases.

DANDELI'ON (*Leontŏdon Taraxăcum*). A plant belonging to the nat. ord. Compositæ, indigenous to Europe, but now also common in

Dandelion

America. The leaves are all radical, and runcinate or jagged on the margin. From this circumstance has been derived its French name *dent-delion* (lion's tooth), of which the English appellation is a corruption. The stems are hollow and have one large bright-yellow flower-head and a tapering milky perennial root, which acts as an aperient and tonic, and is much esteemed in affections of the liver. The whole plant is full of a milky and bitter juice. The fruit of the plant is furnished with a white pappus and is transported far and wide by the wind.

DANDIE DINMONT TERRIER. A peculiar breed of the Scotch terrier, so called from the Border farmer of that name who figures in Scott's novel of *Guy Mannering*. The present representatives of the breed trace their origin to the terriers of one James Davidson of Hyndlee, who lived in the early period of the nineteenth century, and who possessed a famous strain of terriers. The breed is known by its short legs, wiry and abundant hair, and large ears. It is very courageous when fully grown. It is usually either of a light-brown or a bluish-grey colour, termed respectively the "Mustard" and the "Pepper" variety.

DAN'DOLO, Andrea. Doge of Venice and of an illustrious Venetian family, was born about 1310, and made doge in 1343. He carried on a war against the Turks with varying success, and greatly extended Venetian commerce by opening a trading connection with Egypt. He wrote a chronicle of Venice, comprising the history of the Republic from its commencement to 1339, which was published in Muratori's collection, *Rerum Italicarum Scriptores* (vol. xxi.). He died in Sept., 1354.

DANDOLO, Enrico. Doge of Venice, was chosen to that office in 1192, at the advanced age of eighty-four. On the formation of the fourth Crusade, Dandolo induced the Senate to join in it, and by its help recovered the revolted town of Zara. Constantinople was next stormed, the blind old doge, it is said, leading the attack. In the division of the Byzantine Empire the Venetians added much to their dominions. Dandolo died at Constantinople in 1205, at the age of ninety-seven.

DANDRUFF. Excessive dandruff—dead, flaky skin—indicates an infectious disease of the scalp (*Seborrhoea*) very difficult to cure and liable to result in baldness.

Treatment consists in frequent washing of the scalp with bland, pure soap, the removal of all dead, scaly matter, mild antiseptic and oily dressings and massage. Olive oil rubbed into the scalp before washing is helpful in removing the dandruff. Ultra-violet ray treatment is effective, and attention to the general health is of the greatest importance.

Another type of seborrhoea is accompanied by excessive greasiness, but the same general treatment is indicated.

DANEBROG, or **DANNEBROG** (dân'ebrog), literally "the cloth or banner of the Danes." A Danish order of knighthood, instituted by Waldemar II. in 1219, and revised in 1671 by Christian V. The decoration consists of a cross of gold *patée*, enamelled with white, and suspended by a white ribbon edged with red.

DANE'GELT, or **DANE'GELD** (that is, "Dane tax"). In English history, an annual tax laid on the English nation for maintaining forces to oppose the Danes, or to furnish tribute to procure peace. It was at first one shilling, and ultimately seven, for every hide of land, except such as belonged to the Church. When the Danes became masters of England, the *danegelt* was a tax levied by the Danish princes on every hide of land owned by the English. It continued to be levied until 1163, when it was repealed by Henry II.

DANE'LAGH, or **DANELAW.** The ancient name of a strip of territory extending along the east coast of England from the Thames to the Tweed, ceded by Alfred to Guthrun, king of the Danes, after the battle of Ethandune. This name it retained till the Norman conquest, its inhabitants being governed by a modification of Danish law and not by English law.

DANEWERK (dä'ne-verk; Ger., "Danes' work"; Dan., *Dannevirke*). An ancient wall of about from 30 to 40 feet high, and of an equal thickness, extending along the southern frontier of Schleswig for nearly 10 miles, from the North Sea to the Baltic. It was constructed in the middle of the tenth century and repaired in 1850, but was captured by the Austrians and Prussians in the Schleswig-Holstein War of 1864 and soon after destroyed.

DAN'IEL (Heb., "God is my judge"). The prophet, a contemporary of Ezekiel, was born of a distinguished Hebrew family. In his youth, 605 B.C., he was carried captive to Babylon, and educated in the Babylonish court for the service of King Nebuchadnezzar. Thrown into the lions' den for conscientiously refusing to obey the king, he was miraculously preserved, and finally made chief adviser in the court of the Persian King Darius. He is one of the "greater prophets."

The book of the Old Testament which bears his name is d vided into an historical and a prophetic part. Modern criticism generally regards it as written during the oppression of the Jews under Antiochus, about 170 B.C. It is partly in Aramaic.

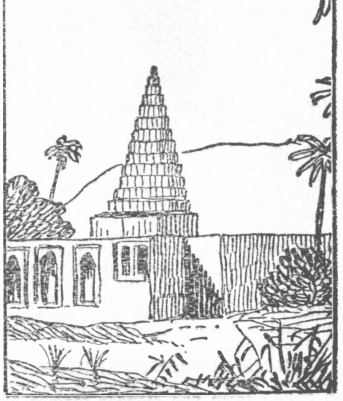
DANIEL, Samuel. An English historian and poet, contemporary with Shakespeare, was born in 1562, died in 1619. Under the patronage of the Pembroke family he received several court appointments, but he commonly lived in the country, employed in literary pursuits.

His great poem, *The History of the Civil Wars between the Houses of York and Lancaster*, is written with much rhetorical grace and dignity of style. He wrote also *Epistles to Distinguished Persons*; *Musophilus*, a dialogue; besides pastorals, sonnets, a few tragedies, and a *History of England* till the time of Edward III. His works were edited by A. B. Grosart (1885-96).

DAN'IELL, John Frederick. A distinguished English physicist, born at London 12th March, 1790, died 13th March, 1845. In 1816 he commenced the *Quarterly Journal of Science and Art* in concert with Brande. In 1820 he published an account of a new hygrometer which he had invented. Soon afterwards his valuable works, *Meteorological Essays* and the essay on *Artificial Climate*, appeared.

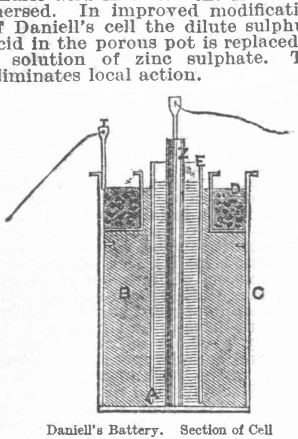
In 1831 he was appointed professor of chemistry in King's College, London, and made further important discoveries, chief amongst which is his battery for maintaining a powerful and continuous current of electricity (see next article). For these discoveries he received successively the three medals in the gift of the Royal Society. In 1843 he was made a D.C.L. of Oxford.

DANIELL'S CELL. A voltatic cell which was originally constructed in the following way. A tall cylindrical copper vessel was nearly filled with saturated solution of sulphate of copper. A rod of amalgamated zinc



Daniel's Tomb

was enclosed in a skin or bladder, which was filled with dilute sulphuric acid, and was suspended in the copper cylinder. When the zinc rod is connected by a wire with the copper vessel, which itself forms one of the plates of the cell, the current passes from the copper through the wire to the zinc. Instead of the bladder or skin porous earthenware pots are now employed to contain the dilute sulphuric acid in which the zinc is immersed. In improved modifications of Daniell's cell the dilute sulphuric acid in the porous pot is replaced by a solution of zinc sulphate. This eliminates local action.



Daniell's Battery. Section of Cell

C, Outer copper cell. B, Solution of sulphate of copper. D, Shelf for sulphate of copper. E, Porous cell. A, Sulphuric acid. Z, Zinc.

The following is an outline of the action of such a cell. The positively charged ions of copper move towards the copper vessel, give up their positive charge there, and are deposited as a fresh layer of copper on the inside of the vessel. The zinc ions similarly move towards the copper vessel, and in the copper sulphate solution take the place of copper ions and form zinc sulphate. The negatively charged SO_4 ions move towards the zinc rod, and, after giving up their charge, dissolve zinc from the rod, forming fresh zinc sulphate solution in the porous pot. The electrical energy is derived from the conversion of zinc into zinc sulphate. So long as the supply of copper sulphate is kept up, copper and not hydrogen is released at the positive electrode. The cell is thus free from polarization, and is capable of maintaining a constant current in a circuit for a long period. In order that the copper sulphate solution may remain saturated, the shelf at the top of the copper vessel is kept full of copper sulphate crystals.

DANKALI', or **DANA'KIL** (the former is the Arabic singular, the latter the plural), the common name of a number of wild tribes that inhabit Africa east of Abyssinia, between it and the Red Sea, bordering on the south with the Somalis. They are Ethiopians, but their features clearly indicate an intermixture of Arab blood, Some engage in fishing, others in the rearing of cattle. They are of the Mohammedan religion, and are estimated to number about 70,000.

DAN'NECKER, Johann Heinrich. German sculptor, born in 1758, died in 1841. Early signs of talent recommended him to the notice of Charles, Duke of Würtemberg. As a student at the Karlschule he greatly distinguished himself, was appointed court sculptor, and visited Paris and Rome. In 1790 he returned to Würtemberg, and became professor of the Fine Arts at Stuttgart. His best works are his statue of Christ and his *Ariadne seated on a Panther*. His portrait busts are excellent; those of Schiller, Lavater, and the Duchess Stephanie of Baden deserve particular mention.

DANNEMO'RA. A village, on a lake of the same name, 24 miles N.N.E. of Upsala, in Sweden, celebrated for its iron-mines, the second richest in Sweden, which have been worked for upwards of three centuries, and produce the finest iron in the world.

D'ANNUNZIO. *See* ANNUNZIO.

DANTE (a contraction of *Durante*) **ALIGHIERI** (dän'tā ä-lē-gē-ä'rē). The greatest of Italian poets, was born in Florence between 18th May and 17th June, 1265, of a family belonging to the lower nobility, died 1321. His education was confined to the learned Brunetto Latini. He is said also to have studied at various seats of learning, and it is certain that either at this time or in the course of his wandering life he made himself master of all the knowledge of his time. He seems to have been quite a boy, no more than nine years of age, when he first saw Beatrice Portinari, and the love she awakened in him he has described in that record of his early years, the *Vita Nuova*, as well as in his later great work, the *Divina Commedia*, in terms which make it hard to distinguish the real personality of Beatrice from some ideal power of beauty and virtue of which she is to Dante the symbol. Their actual lives at least went far enough apart. Beatrice marrying a noble Florentine, Simone Bardi, in 1287, and dying three years afterwards; while the year following Dante married Gemma

dei Donati, by whom he had seven children.

At this time the Guelfic party in Florence became divided into the rival factions of Bianchi and Neri (Whites and Blacks), the latter being an extreme Papal party, while the former leaned to reconciliation with the Ghibellines. Dante's sympathies were with the Bianchi, and, being a prior of the trades and a leading citizen in Florence, he went on an embassy to Rome to influence the Pope on behalf of the Bianchi. The rival faction of the Neri, however, had got the upper hand in the city, and in the usual fashion of the time were burning the houses of their rivals and

Dante
Italy's greatest poet

slaying them in the open street. In Dante's absence his enemies obtained a decree of banishment against him, coupled with a heavy fine, a sentence which was soon followed by another condemning him to be burned alive for malversation and peculation.

From this time the poet became, and to the end of his life remained, an exile; and his history, first lost by the indifference of contemporaries and then hallowed by the legends of later generations, becomes semi-mythical. He has told us himself how he wandered "through almost all parts where this language is spoken," and how hard he felt it "to climb the stairs and eat the bitter bread of strangers." During this period he is said to have visited many cities, Arezzo, Bologna, Sienna, and even Paris. In 1314 he found shelter with Can Grande della Scala at Verona, where he remained till 1318. In 1320 we find him staying at Ravenna with his friend Guido da Polenta. In Sept., 1321, his sufferings and wanderings were ended by death. He was buried at Ravenna, where his bones still lie.

His great poem, the *Divina Commedia* (Divine Comedy), written in great part, if not altogether, during his exile, is divided into three parts, entitled Hell, Purgatory, and Paradise. The poet dreams that he has wandered into a dusky forest, when the shade of Virgil appears and offers to conduct him through hell and purgatory. Further the pagan poet may not go, but Beatrice herself shall lead him through paradise. The journey through hell is first described, and the imaginative power with which the distorted characters of the guilty and the punishments laid upon them are brought before us; the impressive pathos of these short histories—often compressed in Dante's severe style into a couple of lines—of Pope and Ghibelline, Italian lord and lady; the passionate depth of characterization, the subtle insight and intense faith, make up a whole which for significance and completeness has perhaps no rival in the work of any one man, except Æschylus and Shakespeare.

From hell the poet, still in the company of Virgil, ascends to purgatory, where the scenes are still mostly of the same kind though the punishments are only temporary.

In the earthly paradise Dante beholds Beatrice in a scene of surpassing magnificence, ascends with her into the celestial paradise, and after roaming over seven spheres reaches the eighth, where he beholds "the glorious company which surrounds the triumphant Redeemer." In the ninth Dante feels himself in presence of the divine essence, and sees the souls of the blessed on thrones in a circle of infinite magnitude. The Deity himself, in the tenth, he cannot see for excess of light.

Dante may be said not only to have made Italian poetry, but to have stamped the mark of his personality upon all modern literature. His influence upon English letters begins with the poetry of Chaucer. Dante's moral system is largely derived from St. Thomas, and he certainly owes much to the Neoplatonics, and especially to St. Augustine, but his own contemporaries considered the *Divina Commedia* as a book of divine wisdom.

The visionary experience upon which the whole work is based is the result of a sudden realization of the

hideousness of vice and the beauty of virtue, and of the universality and omnipotence of love; a realization which came upon the poet with the force of a special revelation.

There are many notable translations of Dante's great poem. Amongst English versions we may mention those of Cary, Longfellow, Dean Plumptre, and Haselfoot, and prose translations by Dr. John Carlyle, C. E. Norton, and H. F. Tozer. The *Vita Nuova* has been admirably translated by D. G. Rossetti in his *Early Italian Poets*.

Dante's other works are: *Il Convito* (The Banquet), a series of philosophical commentaries on the author's canzoni; *Il Canzoniere*, a collection of poems; a Latin treatise, *De Monarchia*, a work intended to prove the supremacy of the head of the holy Roman Empire; a treatise on the Italian language, entitled *De Vulgari Eloquio*; and an inquiry into the relative altitude of the water and the land, *De Aqua et Terra*.

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DANTON (dăn-tōn), **Georges Jacques.** An advocate by profession, and one of the great figures in the French Revolution, born 1759, executed in 1794. His colossal stature, athletic frame, and powerful voice contributed not a little, together with his intellectual gifts and audacity, to win him a prominent position amongst the revolutionaries. He founded the club of the Cordeliers, was foremost in organizing and conducting the attack on the Tuileries, 10th Aug., 1792, and for such services was made Minister of Justice and a member of the Provisional Executive Council.

When the advance of the Prussian army spread consternation amongst the members of the Government, Danton alone preserved his courage, and in a celebrated speech summoned all Frenchmen capable of bearing arms to march against the enemy. He voted for the capital punishment of all returning aristocrats, but undertook the defence of religious worship, and along with Robespierre brought Hébert and the worshippers of the goddess Reason to the scaffold.

But the rivalry of the two great leaders had now reached a point when one must succumb, and the crafty Robespierre succeeded in having Danton denounced and thrown into prison, 31st March, 1794. Five days afterwards he was condemned by the revolutionary tribunal as an accomplice in a conspiracy for the restoration of monarchy, and executed the same day.—BIBLIOGRAPHY: J. F. E. Robinet, *Danton: homme d'état*; A. H. Beesly, *Life of Danton*; H. Belloc, *Danton*.

DAN'UBE (ancient **Ister** or **Danubius**; Ger. *Donau*). A celebrated river of Europe, originates in two small streams rising in the Schwarzwald, or Black Forest, in Baden, and uniting at Donaueschingen. The direct distance from source to mouth of the Danube is about 1000 miles, and its total length, including windings, about 1800 miles.

From its source the Danube flows in a north-easterly direction to Ulm, in Württemberg, where it becomes navigable for vessels of 100 tons; then to Ratisbon in Bavaria, where it becomes navigable for steamers. Here it turns in a south-easterly direction, entering Austria near Passau, passing Vienna and Budapest, above which latter town it suddenly turns due south, holding this direction till it is joined by the Drave, after which it runs S.S.E. through Yugoslavia, entering Serbia at Belgrade. Continuing its general course eastward, it forms for a long distance the boundary-line between Rumania and Bulgaria. At Silistria it once more turns northwards, and, flowing between Rumania proper and Bessarabia, falls into the Black Sea by three different outlets.

In the upper part of its course, through Württemberg and Bavaria, the Danube flows through some of the most fertile and populous districts of its basin. Its principal affluents here are the Iser and Lech. In Austria it passes through a succession of picturesque scenery till past Vienna, the land on both sides being well peopled and cultivated. The principal affluents are the March, or Morawa, and the Ens. After passing through what is called the Carpathian Gate, at Bratislava (Pressburg), where it enters Hungary, it breaks up into a number of branches forming a labyrinth of islands known as Schütten, but on emerging it flows uninterruptedly southwards through wide plains interspersed with pools, marshes, and sandy wastes. The principal affluents here are the Save, the Drave, and the Theiss. Sixty miles before entering Rumania the river passes through a succession of rapids or cataracts which it has made

in cutting a passage for itself through the cross-chain of hills which connect the Carpathian Mountains with the Alps. The last of these cataracts, at Old Orsova, is called the Iron Gate.

The lower course of the Danube, in Rumania and Bulgaria, is through a flat and marshy but fertile and densely peopled wheat-producing region. In this part it increases its width from 1400 to 2100 yards, forms an expanse like a sea, and is studded with islands. Of the three outlets the Sulina Mouth is the deepest, and is the most used up-river channel.

The Danube is navigable for steamers up to Ratisbon (Regensburg), nearly 1500 miles from its mouth. Some of its tributaries, such as the Save, the Theiss, and the Drave, are also navigable, so that the water system of the Danube may be estimated as admitting of about 2500 miles of steam navigation. — BIBLIOGRAPHY : Sir C. A. Hartley, *Description of the Delta of the Danube*; F. D. Millet, *The Danube*; B. G. Baker, *The Danube with Pen and Pencil*; Walter Jerrold, *The Danube*.

DANUBIAN CIVILIZATION. A term applied to the culture area north of the Ægean area. It was influenced by Ægean culture, but had marked local features. Pastoral and trading peoples in the Danube Valley and on the Danube Valley trade-route leading to the Baltic and the North Sea developed a vigorous culture, but have left no inscriptions. Their weapons and implements of bronze and iron are of well-marked types. They were chariot-racers, fierce warriors, fairer than the Ægeans, keepers of pigs and eaters of pork and drinkers of beer.

The Achæans who overran Greece were pork-eating, fighting pastoralists. So were the Celts who swept westward. According to Greek writers, the Celts were tall and fair or ruddy, and it may be the Caledonians of Scotland, whose tribal name is Celtic, were of this stock.

There was, however, much racial fusion in the Danubian area. There was certainly culture mixing. Ægean influence met Anatolian, and the burial customs vary, as do the skulls found in ancient graves. A cremating people swept westward into France and through the British Isles, and cremation was practised by the Homeric warriors. The diffusion of Indo-European languages is believed to be connected with the periodic ethnic disturbances in the Danubian area.

As the conquering Semites absorbed the old civilizations of Mesopotamia and Egypt, so apparently did the Danubian peoples absorb, after conquest, the older Ægean civilization, mixing it with their own. An Anatolian element, such as the Pelop also entered the ethnic "meltin pot" from which emerged "the glo that was Greece."

DANUBIAN PRINCIPALITIES. name formerly given to the prin palities of Moldavia and Wallachi now belonging to Rumania. It w also often used for Serbia a Bulgaria.

DAN'VERS. A town of the Unit States, Massachusetts, 15 miles N.N. of Boston, with tanneries and man factures of boots and shoes. Po 12,957.

DAN'VILLE. Three towns, Unite States.—(1) In Illinois; it has coa mines. Pop. 36,765.—(2) In Pen sylvania; it has blast-furnaces an rolling-mills. Pop. 7185.—(3) In Vi ginia; an important tobacco centr Pop. 22,247.

DANZIG (dänt'-*hiz*; Pol. *Gdansk* Until 1919 a fortified town and por Prussia, capital of the province West Prussia, 253 miles N.E. of Berli on the left bank of the west arm the Vistula, about 3 miles above it mouth in the Baltic, and intersecte by the Mottlau, which here divide into several arms.

In 1919 Danzig, with the surrounding territory, was constituted a Fre City by the terms of the Treaty Versailles, and placed under the pro tection of the League of Nations. Th Constitution, approved by the Leagu of Nations in Nov., 1920, provide for a diet of 120 members, and Senate. The present High Com missioner assumed office in Oct. 1932. The area of the Free City i about 754 sq. miles; pop. (1929) 407,517; pop. of administrative district (1929), 235,237; this in cludes Oliva, incorporated 1926.

The more modern parts of the town are regularly and well built; in the other parts the streets are narrow and the houses old and indifferent. Amongst the principal buildings are the Dom or Cathedral, begun in 1343 the church of St. Catherine, the exchange, the arsenal, and observatory. The industries are numerous, but, excepting those connected with shipbuilding, artillery, and beer, not of great importance.

Danzig has for centuries been a well-known shipping port and grain market, and the advantages of its geographical position have often placed it in the first rank and increased its prosperity. The proper port of Danzig is Neufahrwasser, at the mouth of the Vistula; but vessels of large size can now come up to and enter the town. After being

ernately possessed by the Teutonic ights and the Poles, Danzig, on the rtition of Poland, fell to the lot of ussia in 1793.

DAPH'NE. The Greek name for ırel, in Greek mythology a nymph loved by Apollo. Deaf to the suit the god, and fleeing from him, she sought Zeus to protect her. Her ayer was heard, and at the moment ›ollo was about to encircle her in his ms she was changed by her mother, ea, into a laurel, a tree thenceforth nsecrated to the god.

DAPH'NE. A genus of plants, nat. d. Thymeleaceæ. They are shrubs, habiting the greater part of the ›rthern hemisphere, but chiefly the uth of Europe and the warmer parts Asia. The best known is the ezereon (*D. Mezerĕum*), with pale- een leaves and very fragrant ›wers. *D. Laureŏla* (spurge laurel) ıs an irritant bark, and its berries e poisonous.

DAPH'NIA. The water-flea. A ›nus of minute crustaceans belong- g to the division Branchiopoda. The est-known species is the *D. pulex*, or branch-horned" water-flea, which a favourite microscopic object. The ead is prolonged into a snout, and provided with a single, central, ›mpound eye; it is also furnished ith antennæ, which act as oars, pro- elling it through the water by a ›ries of short springs or jerks. These nimals are very abundant in many onds and ditches; and the red olour which they assume in summer nparts the appearance of blood to he water.

DARAB', or DARABJERD. A town, ›ersia, province of Farsistan, beauti- ully situated in an extensive plain mong groves of dates, oranges, and emons, 140 miles S.E. of Shirza. ›op. about 15,000.

DĂR-AL-BAIDA, DAR-EL-BEIDA, or CASA BLANCA. A seaport on the ıtlantic coast of Morocco, exporting inseed, peas, beans, barley, and eggs, nd importing British and other ›oods.

DARBHAN'GAH. A town of India, n the Patna division of Behar, in a ow-lying district subject to inunda- ion; it is the residence of the Maha- ajah of Darbhangah, who has a fine ıew palace here. Pop. 53,700.

D'AR'BLAY, Madame. Maiden ıame Frances Burney, born in 1752 ıt Lynn-Regis in Norfolk, died at Bath 1840. She was the second laughter of Dr. Burney, author of he *History of Music*. In 1786 she vas appointed one of the keepers of he robes to Queen Charlotte; in 793 married the Comte d'Arblay, a French emigrant artillery officer, with whom she afterwards went to France, and who, on the restoration of the Bourbons, attained the rank of general.

She gained considerable celebrity by her literary productions. These were mostly novels, of which she produced four—*Evelina*, *Cecilia*, *Camilla*, and *The Wanderer*. She published the memoirs of her father, which appeared in 1832, and seven volumes of her *Letters and Diaries*, edited by her niece, were also published.

DAR'DANELLES (-nelz; ancient Hellespont). A narrow channel which connects the Sea of Marmora with the Grecian Archipelago, and at this particular point separates Europe from Asia. It is about 40 miles in length, and varies in breadth from 1 to 4 miles. A rapid current often much increased by winds runs southward.

On the Asiatic side the country is fine and fertile, rising gradually upwards from the sea to the range of Mount Ida; the European side is steep and rugged but densely peopled and highly cultivated. On both shores there are numerous forts and batteries. Two castles on the opposite shores occupy the sites of ancient Sestos and Abydos, and recall the story of Hero and Leander.

History.—By treaty made in 1841 between the five Great Powers and Turkey, confirmed by the Peace of Paris in 1856, it was settled that no non-Turkish man-of-war should pass the strait without the express permission of the Turkish Government. In April, 1912, the Dardanelles were closed so as to prevent the Italian fleet from attacking the Turkish warvessels stationed there, but they were reopened on 1st May, in consequence of the protests of the Neutral Powers.

On 3rd Nov., 1914, the forts were bombarded by a combined British and French squadron, and in May, 1915, an army was landed in the Dardanelles, but the attempt of the Allies to force the Dardanelles proved a failure. A Dardanelles Commission was subsequently constituted by the British Government in 1916, and the first report published on 8th March, 1917. By the Treaty of Lausanne made in 1923 between the Allied Powers and Turkey, the latter lost possession of all her fortresses in Europe and Asia, and the defences of the Dardanelles and the Bosporus were demolished. Except for these provisions Turkey holds the Dardanelles area in unrestricted sovereignty. See Gallipoli section in article EUROPEAN WAR.

DARDANELLES COMMISSION. A Royal Commission appointed by the

British Parliament to investigate and inquire into the failure of the Dardanelles campaign of 1915. The members of the Commission were Lord Cromer, chairman, Andrew Fisher, Sir Thomas Mackenzie, Sir Frederick Cowley, W. F. Roch, James A. Clyde, Stephen L. Gwynne, Admiral Sir W. H. May, Lord Nicholson, and Lord Justice Pickford. This Commission sat through 1916, and published two Reports, one in March, 1917, and the second in Nov., 1919. There were minority Reports, one containing a dissent by A. Fisher and Sir T. Mackenzie on certain details, and a separate Report by Walter Roch, member of Parliament.

The Report is remarkable for its candour, and frankly censured the Asquith Government, especially Mr. Asquith himself, Lord Fisher, and Lord Kitchener for the failure of the campaign. When the first section of the Report was published in March, 1917, a discussion arose in the press as to why a document revealing the inner history of an ill-fated campaign should be published by the Government in time of war. The opposition maintained that this was done by the Lloyd George Government for political reasons, with a view to discrediting the Asquith administration.

DAR'DANUS. In Greek mythology, son of Zeus and Electra, the daughter of Atlas. He is the mythical ruler of the Dardanians, who are identified with the Trojans.

DARD'ISTAN. That is, the country of the Dards, a mountainous region in Asia, on the Upper Indus, included within the boundaries of British India, and partly in Kashmir, and which is held by the Dards and other tribes owning little allegiance to any superior. The Dards speak an Aryan tongue allied to the Sanskrit, were once Buddhists, but are now Moslems by religion. The name is used sometimes in a wider, sometimes in a narrower sense, roughly as equivalent to the Gilghit Agency.

DAR-ES-SALAAM'. The capital of Tanganyika Territory, a seaport with a good natural harbour and a dock, a fortified military station, partly consisting of stone houses, partly of native huts; carries on a considerable trade in rubber and other African commodities. It was captured by the British in Sept., 1916. Pop. 38,147.

DARFUR', or DARFOOR'. A considerable region of central Africa, forming a large oasis in the south-east corner of the Great Desert. It may be considered as lying between lat. 11° and 15° N., and long. 26° and 29° E.; on the East it has Kordofan and on the west Bornu, while the regions to the south are occupied by barbarous nations. The inhabitants are Mohammedans and negroes, and semi-barbarous. Their occupation is chiefly agriculture, and cattle form their principal wealth. The ruler is a native sultan.

There is a trade with Egypt carried on by means of caravans. Among the articles that Darfur exports are ivory, ostrich feathers, gum, and copper; it imports sugar, cotton cloth, hardware, and fire-arms. Unlimited polygamy is allowed, and the morals and manners of the natives are of a very degraded kind. Darfur is part of the Anglo-Egyptian Sudan; area, 150,000 sq. miles. Pop. estimated at 1,000,000.

DARGAI. Station on the Indian frontier. On the Afghan border of the north-west province, its railway station, the most northerly in India, terminates a branch from Naushahra. It is on a hill range dominating the Malakand Pass into the Swat valley, and in the Tirah campaign of 1897–98 British troops were forced to abandon it from lack of water, but it was retaken, after an unsuccessful first attack, by the Gordon Highlanders, supported by the 2nd Gurkhas and the 3rd Sikhs, Oct. 20, 1897.

DARIC. An ancient Persian gold coin of Darius, weighing about 129 grains, value about 25*s.*, and bearing

Golden Daric, from British Museum

on one side the figure of an archer. In later times the name has been applied to a silver coin having the figure of an archer.

DA'RIEN, Gulf of. A gulf of the Caribbean Sea at the north extremity of South America, between the Isthmus of Panama and the mainland.

DARIEN, Isthmus of. Often used as synonymous with the Isthmus of Panama, but more strictly applied to the neck of land between the Gulf of Darien and the Pacific.

DARIEN SCHEME. A celebrated financial project, conceived and set afloat by William Paterson, a Scotsman, towards the close of the seventeenth century. Paterson was a man of bold and original conceptions, and possessed of a wide knowledge of commerce and finance. He was the

'st projector of the Bank of Eng-nd, but did not receive his just compense. His next scheme was ıe of magnificent proportions. He 'oposed to form an emporium on ,ch side of the Isthmus of Darien or ınama for the trade of the opposite ıntinents. The settlement thus rmed would become the entrepôt r an immense exchange between the anufacturers of Europe and the pro-ıce of South America and Asia.

Paterson had designed to limit the ɜnefits of the scheme to Scotland ıainly, but had to seek help in ondon, where the subscriptions soon ın up to £300,000. Alarm was soon xcited amongst the English merch-ıts, especially those connected with ıe Indies, at the gigantic Scottish :heme, and the English subscrip-ons were withdrawn. Scotland, in-ignant at this treatment, subscribed t once and with great enthusiasm 400,000, a full half of all the cash ı the kingdom. Little more than the alf, however, was paid up. In 1698 ve large vessels laden with stores, nd with 1200 intending colonists, ailed for the Isthmus of Darien.

The settlement was formed in a uitable position, and the colonists ortified a secure and capacious har-our; but nothing else had been ightly calculated. Many of the olonists were men who knew nothing bout colonizing; the provisions ere either improper for the climate ır soon exhausted; the merchandise hey had brought was not adapted or the West Indian market. To ıdd to their difficulties the colonists ere attacked by the Spaniards and ll commerce forbidden with them. For eight months the colony bore up, ut at the end of that time the sur-ivors were compelled by disease and amine to abandon their settlement nd return to Europe. Two of the hips were lost on the way home, and nly about thirty men, including Paterson, reached Scotland.—Cf. A. Lang, *History of Scotland*.

DARI'US. The name of several Persian kings.—(1) **Darius I.**, fourth King of Persia, son of Hystaspes, a prince of the royal family of the Achæmenidæ, attained the throne in 521 B.C. His reign was distinguished by many important events. He reduced, after a two years' siege, the revolted city of Babylon, and led an expedition of 700,000 men against the Scythians on the Danube, from which he extricated himself after suffering great losses.

To revenge himself against the Athenians who had promoted a revolt of the Ionian cities, he sent an army under Mardonius to invade Greece. But the ships of Mardonius were destroyed by a storm in doubling Mount Athos (492 B.C.), and his army was cut to pieces by the Thracians. Darius, however, fitted out a second expedition of 500,000 men, which was met on the plains of Marathon by an Athenian army 10,000 strong, under Miltiades, and completely defeated (490 B.C.). Darius had determined on a third expedition when he died, 485 B.C.

(2) **Darius II.**, surnamed *Nothus*, or the Bastard, by the Greeks, an illegitimate son of Artaxerxes I. (*Longimânus*). He ascended the throne in 423 B.C., and died in 404 B.C. His son Cyrus is familiar to us through Xenophon's *Anabasis*.

(3) **Darius III.**, surnamed *Codomannus*, great-grandson of Darius II., was the twelfth and last King of Persia. He ascended the throne 336 B.C., when the kingdom had been weakened by luxury and the tyranny of the satraps under his predecessors, and could not resist the attacks of a powerful invader. Such was Alexander of Macedon; and the army which was sent against him by Darius was totally routed on the banks of the Granicus, in Asia Minor. Darius then hastened with 400,000 soldiers to meet Alexander in the mountainous region of Cilicia, and was a second time totally defeated near the Issus, 333 B.C.

Two years afterwards, all proposals for peace having been rejected by Alexander, Darius collected a second army, and, meeting the Macedonian forces between Arbela and Gaugamela, was again routed and had to seek safety in flight (331 B.C.). Alexander now captured Susa, the capital, and Persepolis, and reduced all Persia. Meanwhile Darius was collecting another army at Ecbatana in Media, when a traitorous conspiracy was formed against him by which he lost his life in 330 B.C. Alexander married his daughter Statira.

DARJEEL'ING, or DARJILING. A district of India, in the extreme north of the lieutenant-governorship of Bengal, near the Sikkim frontier; area, 1614 sq. miles. Tea, coffee, cinchona, and cotton are cultivated, and the cultivation of the tea-plant and the making of tea is now the staple industry. Pop. 282,748.

Darjeeling, the chief town, is a sanitary station and the summer quarters of the Bengal Government, and, though little more than 36 miles from the plains, stands at an elevation of 7400 feet above sea-level, on a ridge with deep valleys on either side, in a bleak but healthy situation.

There is a residence of the Lieutenant-Governor, barracks, and a sanatorium. The town was acquired by the British Government in 1845. Pop. 22,258, much increased in the hot weather.

DAR'LASTON. A town and parish, England, 17 miles S. by E. of Stafford. It has extensive coal- and iron-mines. Pop. (1931), 19,736.

DARLING, Grace. A celebrated English heroine, was born in 1815 in the Longstone Lighthouse (Farne Islands, coast of Northumberland), of which her father was keeper. In 1838 the steamer *Forfarshire*, with forty-one passengers on board besides her crew, became disabled off the Farne Islands during a storm, and was thrown on a rock, where she broke into two, part of the crew and passengers being left clinging to the wreck. Next morning William Darling descried them from Longstone, about a mile distant, but he shrank from attempting to reach the wreck through a boiling sea in a boat. His daughter Grace, however, implored him to make the attempt and let her accompany him. At last he consented, and father and daughter each taking an oar, they reached the wreck and succeeded in rescuing nine sufferers.

The news of the heroic deed soon spread, and the brave girl received testimonials from all quarters. A purse of £750 was publicly subscribed and presented to her. Four years afterwards she died of consumption, 20th Oct., 1842.

DARLING, Lord. English lawyer. Charles John Darling was born 6th Dec., 1849, and became a barrister. In 1888 he was elected Conservative M.P. for Deptford, a seat he retained until made a judge in 1897. He retired in 1923, and in 1924 was made a baron. His reputation as a wit was maintained by the volumes of verse he published, including *On the Oxford Circuit*.

DARLING (from a governor of New South Wales). A name of several applications in Australia.

The **Darling River.** A river rising in the north-east of New South Wales, flows in a south-westerly direction till it joins the Murray. Length, 1160 miles.

Darling District is a pastoral district, about 50,000 sq. miles in extent, in the south-west of New South Wales, and watered by the Darling and the Murray.

The **Darling Downs** are a rich tableland west of Brisbane in Queensland. It is well watered, and measures about 6000 sq. miles.

The **Darling Range** is a range of granite mountains in Western Australia, running in a northerly direction parallel with the coast from Point d'Entrecasteaux for 250 miles.

DAR'LINGTON. A municipal and parliamentary borough, England, county and 18½ miles S. of Durham; well built, chiefly of brick. The woollen manufacture is carried on to a considerable extent, and there are large ironworks, and works manufacturing steel, locomotive engines, and iron bridges. Pop. (1931), 72,093.

DARLINGTO'NIA. A remarkable genus of American pitcher-plants, nat. ord. Sarraceniaceæ. A single species is known from California. The leaves are long and trumpet-shaped, with a wing rising from one side of the mouth.

DARMSTADT (dårm'stât). A town, Germany, capital of the Republic of Hesse, in a sandy plain, on the Darm, 15 miles S. of Frankfurt. It consists of an old and a new town. The former, which is the business part of the town, is very poorly built; the houses are old, and the streets narrow and gloomy. The new town is laid out with great regularity, and has handsome squares and houses. Among the remarkable buildings are the old palace (with a library of 500,000 volumes and 4000 MSS., a picture-gallery, and a rich museum of natural history), the Roman Catholic Church, and the Rathhaus or town hall built in 1580. Darmstadt has numerous and varied industries, which include machinery, carpets, chemicals, and hats. Pop. 89,465.

DARMSTADT, or **HESSE-DARMSTADT.** *See* HESSE.

DAR'NEL. The popular name of *Lolium temulentum*, the only poisonous British grass. It appears to be the *infelix lolium* of Virgil, and possibly the tares of Scripture. Its properties are due to the constant presence of a poisonous fungus in the grains. It is met with in cornfields, and is now naturalized in North America.

DARNÉTAL (dår-nā-tål). A town, France, department of Seine-Inférieure, 2 miles E. of Rouen. There are extensive woollen factories and spinning-mills. Pop. 7520.

DARN'LEY, Henry Stuart, Lord. Son of the Earl of Lennox and Lady Margaret Douglas, a niece of Henry VIII. (her mother being first married to James IV.), born 1545. In 1565 he was married to Mary, Queen of Scots. It was an unfortunate match,

ıd ere long gave rise first to cool-ess, then to open quarrel, and finally deadly hate, which the murder Rizzio, to which Darnley was party, only increased. Mary, fected, however, to be reconciled him, but could not long conceal er contempt for the handsome abecile.

After the birth of a son, subse-ıently James VI., Darnley was ized at Glasgow with smallpox, om which he had barely recovered hen Mary visited him, and had him nveyed to an isolated house called irk o' Field, close to the Edinburgh ty walls. This dwelling, which elonged to a retainer of Bothwell's, ıe rapidly rising favourite, was lown into the air with gunpowder 0th Feb., 1567). The dead bodies Darnley and his page were found a field at a distance of 80 yards om the house, quite free from any ark which such an explosion would use. Strong circumstantial evi-ence points to Bothwell as the urderer, and to Mary as an accom-lice in the crime.

DARRANG. An administrative istrict of India, forming a portion the upper valley of the Brahma-utra, in the province of Assam; rea, 3197 sq. miles; pop. 377,314. irgin forests cover a large portion the region.

DARTERS, or SNAKE-BIRDS. A enus (Plotus) of web-footed birds the cormorant family, found near ıe eastern coasts of the tropical arts of America, and on the western oast of tropical Africa, as well as in ustralia, New Zealand, and New Guinea. The birds perch on trees by the sides of lakes, lagoons, and rivers, and, after hovering over the water, suddenly dart at their prey with unerring aim (hence the name). From the serpent-like form of their head and neck, the head being scarcely thicker than the neck, they are called snake-birds.

Darter, or Snake-bird

DART'FORD. A town, England, Kent, on the Darent, 15 miles S.E. of London. On the river are numerous paper-, corn-, and oil-mills, a large foundry, and an extensive gunpowder manufactory. Dartford was the first place in Britain where a paper-mill was erected. Wat Tyler was a native of this place, and the insurrection known by his name broke out at Dartford (1381). Dartford gives its name to a parliamentary division. Pop. (1931), 28,928.

DARTMOOR'. An extensive upland tract in England, in the western part of Devonshire, often called the *Forest of Dartmoor*, and belonging to the Duchy of Cornwall; reaching from Brent south, to Oakhampton north, 22 miles, with a breadth of about 20 miles, and occupying from 130,000 to 150,000 acres. Cattle and sheep are fed on the coarse grass during the summer months. Several of the rugged granite hills (here called *tors*) are of considerable height, Yes Tor rising 2028 feet above the plain.

Dartmoor prison was built in 1806 as a State prison, and subsequently used as a convict depôt. It was used as a place of detention for conscientious objectors until 1919. In 1931 there was serious trouble among the prisoners.

DART'MOUTH. A municipal borough and seaport of England, county of Devon, near the mouth of the Dart. It was at Dartmouth that the Crusaders, under Richard Cœur de Lion, embarked for the Holy Land in 1190. The harbour is safe and commodious, and the port is much resorted to by ocean steamers for coal. There is here the Royal Naval College for cadets, erected at a cost of £500,000, and opened in 1905. Pop. (1931), 6707.

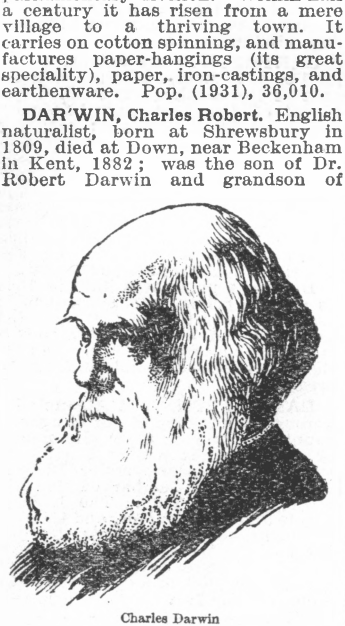
DARTMOUTH. City of Nova Scotia. On the east side of Halifax Harbour, it has engineering works and sawmills and a ferry crosses the harbour. It is the terminus of a railway line, now part of the national system. Pop. (1931), 9100.

DARU, Pierre Antoine Noel Matthieu Bruno, Count. French statesman and author, born at Montpellier 1767, died 1829. He favoured the Revolution, but was imprisoned during the reign of

terror, when he translated the odes and epistles of Horace into French verse. Napoleon discovered his abilities and rewarded him by various official appointments of trust. In the campaigns against Austria and Prussia (1806-9) he served with ability as a diplomatist and financier. He became chief Minister of State in 1811, and was called to the Chamber of Peers in 1818. He afterwards devoted himself exclusively to letters. His chief works are his *History of the Venetian Republic*, *Life of Sully*, and *History of Bretagne*.

DAR'WEN. A municipal borough of Lancashire, England, 3½ miles S. of Blackburn, giving its name to a parliamentary division. Within half a century it has risen from a mere village to a thriving town. It carries on cotton spinning, and manufactures paper-hangings (its great speciality), paper, iron-castings, and earthenware. Pop. (1931), 36,010.

DAR'WIN, Charles Robert. English naturalist, born at Shrewsbury in 1809, died at Down, near Beckenham in Kent, 1882; was the son of Dr. Robert Darwin and grandson of



Charles Darwin

Dr. Erasmus Darwin. He was educated at Shrewsbury School, and at the Universities of Edinburgh and Cambridge. He early devoted himself to the study of natural history, and in 1831 he was appointed naturalist to the surveying voyage of H.M.S. *Beagle*, commanded by Captain (afterwards Admiral) Fitzroy. The vessel sailed in Dec., 1831, and did not return till Oct., 1836, after having circumnavigated the globe.

Darwin came home with rich stores of knowledge, part of which he soon gave to the public in various works. In 1839 he married his cousin, Emma Wedgwood, and henceforth spent the life of a quiet country gentleman, engrossed in scientific pursuits—experimenting, observing, recording, reflecting, and generalizing.

In 1839 he published his *Journal of Researches during a Voyage round the World*; in 1842, *Structure and Distribution of Coral Reefs*; in 1844, *Geological Observations on Volcanic Islands*; in 1846, *Geological Observations in South America*; in 1851 and 1854, his *Monograph of the Cirrhipedia*, and soon after the *Fossil Lepadidæ and Balænidæ of Great Britain*.

In 1859 his name attained its great celebrity by the publication of *The Origin of Species by Means of Natural Selection*. This work, scouted and derided though it was at first in certain quarters, may be said to have effected nothing less than a revolution in biological science. In it for the first time was given a full exposition of the theory of evolution as applied to plants and animals, the origin of species being explained on the hypothesis of natural selection.

The rest of his works are largely based on the material he had accumulated for the elaboration of this great theory. The principal are a treatise on the *Fertilization of Orchids* (1862); *Domesticated Animals and Cultivated Plants, or The Principle of Variation, etc., under Domestication* (1867); *Descent of Man and Variation in Relation to Sex* (1871); *The Expression of the Emotions in Man and Animals* (1872); *Movements and Habits of Climbing Plants*; *Insectivorous Plants* (1875); *Cross and Self Fertilization* (1876); *The Power of Movement in Plants* (1880); *The Formation of Vegetable Mould* (1881); the last containing a vast amount of information in regard to the common earth-worm. Darwin was buried in Westminster Abbey.

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DARWIN, Erasmus, M.D. English physician and poet, was born in 1731. He was educated at Cambridge and Edinburgh; practised as a physician in Lichfield till 1781, when he removed to Derby, near which he died in 1802. His name is chiefly known from his poem of *The Botanic Garden*, which first appeared in 1789; the second part of it, which was known

The Loves of the Plants, appeared anonymously in that year, and the whole was printed together in 1791. The fame it acquired was splendid but very transient, and it has since almost sunk into oblivion.

Between 1794 and 1796 Dr. Darwin published *Zoonomia, or The Laws of Organic Life*; in 1799, *Phytologia, or The Philosophy of Agriculture and Gardening. The Temple of Nature* appeared posthumously in 1803. Charles Darwin was his grandson.

DARWIN, Sir George Howard. son of Charles Darwin, born 1845, died 1912. He wrote many learned papers on subjects more or less connected with astronomy, and especially on tidal action and its affects, including the effects of tidal friction on the rotation of the earth and the moon. He was president of the British Association in 1905, when it held its sittings in South Africa, and was created a K.C.B. the same year. He was again elected president of the British Association shortly before his death.

His younger brother, Sir Francis, born 1848, foreign secretary of the Royal Society since 1903, has published books and papers on botany, including *Elements of Botany*; also *Life and Letters of Charles Darwin*, *More Letters of Charles Darwin*, *Foundation of the Origin of Species*. Sir Francis Darwin was knighted in 1913. He died in 1925.

DA'SENT, Sir George Webbe. Icelandic scholar and miscellaneous writer, born 1817, died 1896; graduated at Oxford, was long assistant-editor of *The Times*, and from 1870 till 1892 was Civil Service Commissioner, being knighted in 1876. His works include translations of *The Prose or Younger Edda*; *The Norsemen in Iceland*; *Popular Tales from the Norse*, a collection of delightful folk-tales; *Tales from the Fjeld*, a similar collection; *The Story of Burnt Njal*, the translation of an Icelandic saga, giving a vivid picture of early Icelandic life; and another translation—*The Story of Gisli the Outlaw*. He also edited an *Icelandic-English Dictionary*.

DASS, Petter. Norwegian poet, of Scottish extraction, born 1647, died 1708. He is known as the "father of Norwegian poetry," and his principal poem, *The Trumpet of Northland*, is one of the most popular national poems.

DAS'YURE, or DASYU'RUS. A genus of climbing marsupials known as brush-tailed opossums, which range through the Australian region, and so named in contrast to the opossums of the New World (Didelphys), which have naked tails somewhat like rats. They prey on birds and their eggs. The Dasyure family (Dasyuridæ) also includes the nearly extinct Tasmanian wolf (*Thylacinus*), and the Tasmanian devil (*Sarcophilus ursinus*), a savage carnivorous beast about the size of a badger, which was formerly most destructive to flocks and poultry-yards, but is now in the inhabited districts nearly extirpated.

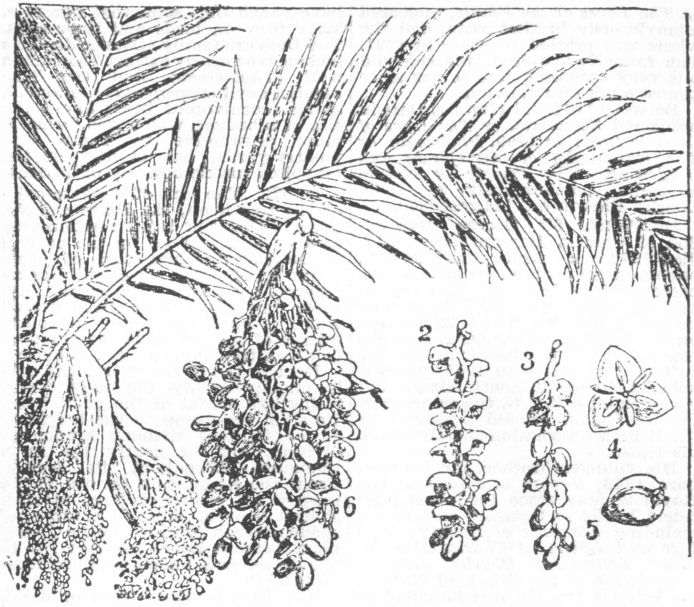
DATE. The fruit of the date-palm or the tree itself, the *Phœnix dactylifera*. The fruit is used extensively as an article of food by the natives of Northern Africa and of some countries of Asia. It consists of an external pericarp, separable into three portions, and covering a seed which is hard and horny in consequence of the nature of the albumen in which the embryo plant is buried.

Next to the coco-nut tree the date is unquestionably the most interesting and useful of the palm tribe. Its stem shoots up to the height of 50 or 60 feet without branch or division, and of nearly the same thickness throughout its length. From the summit it throws out a magnificent crown of large feather-shaped leaves, and a number of spadices, each of which in the female plant bears a bunch of from 180 to 200 dates, each bunch weighing from 20 to 25 lb.

The fruit is eaten fresh or dried. Cakes of dates pounded and kneaded together are the food of the Arabs who traverse the deserts. A species of wine is made from dates by fermentation. Persia, Palestine, Arabia, and the north of Africa are best adapted for the culture of the date tree, and its fruit is in these countries an important article of food.

DATE-PLUM. The name given to several species of Diospyros, a genus of trees of the ebony family. The common date-plum is the *D. Lotus*, a low-growing tree, native of temperate Europe. The American date-plum, or persimmon (*D. virginiana*), attains a height of 50 or 60 feet; the fruit is nearly round, about an inch in diameter, is very astringent, but edible after being frosted. The Chinese date-plum (*D. Kaki*) is cultivated for the sake of its fruit, which is about the size of a small apple, and is made into a preserve. Persimmon wood is very hard, and is used in the manufacture of golf-clubs and other things requiring a hard wood.

DATIA (*dat'i-a*). A native state in Bundelkhand, India, under the Central India Agency. Area, 911 sq. miles; pop. 173,000.—**Datia,** the chief town of the state, is situated 125 miles S.E. of Agra, and contains



1, Date Palm. 2, Male flowers. 3, Female flowers. 4, 5, Male and female flowers. 6, Ripe dates.

a large number of handsome houses, the residences of the local aristocracy. Pop. 25,000.

DAT'OLITE. A mineral silicate of boron and calcium of a white colour, found in Salisbury Crags near Edinburgh, and at Arendal in Norway, as a secondary product mostly in igneous rocks.

DATU'RA. A genus of plants, ord. Solanaceæ, with large trumpet-shaped flowers. There are several species, all having poisonous properties, due to the presence of hyocine, hyoscyamine, and other alkaloids, and a disagreeable odour. *D. Stramonium* is the thorn-apple, possessing strong narcotic properties. The dried leaves of *D. Stramonium*, and *D. Tatula*, an American species, are smoked as a cure for asthma.

DAT'URINE. The name given to a poisonous alkaloid found in the thorn-apple (*Datura Stramonium*), now recognized to be a mixture of two alkaloids, hyoscyamine and atropine.

DAUBENTON (dō-bàṇ-tōṇ), or **D'AUBENTON, Louis Jean Marie.** A French naturalist and physician, born 1716, died 1799. He studied medicine at Paris, and in 1742 began to assist Buffon in the preparation of his great work on natural history, the anatomical articles of which were prepared by him. In 1745 he was appointed curator and demon-

Datura Stramonium. Section of Fruit on Right

itrator of the cabinet of natural history in Paris, of which he had charge for nearly fifty years. He became professor of natural history in the Collège de France in 1778.

Among his publications are: *Instructions to Shepherds*, and *A Methodical View of Minerals*. He contributed many scientific articles to the first *Encyclopédie*.

DAUDET (dō-dā), **Alphonse.** French novelist, born at Nîmes 1840, died in 1897. He settled in Paris in 1857, and wrote poems, essays, and plays, without much success, till he discovered his powers as a novelist, when he speedily became famous. Daudet, who in some respects resembles Dickens, belonged to the naturalist school of fiction. His style, full of light and colour, has been rightly called *impressionist*.

His best works include: *Fromont jeune et Risler aîné* (1874); *Jack* (1876); *Le Nabab* (1877); *Lettres de Mon Moulin* (1866); *Numa Roumestan* (1881); *Contes du Lundi* (1873); *Sapho* (1884); *Tartarin sur les Alpes* (1886), a sequel to *Les Aventures Prodigieuses de Tartarin de Tarascon* (1874); *Trente Ans à Paris* (autobiographical, 1888); *Le Petit Chose* (1868); *Souvenirs d'un homme de lettres* (1889).

DAUDET, Ernest. Elder brother of the preceding, born in 1837, also distinguished himself as a novelist and historian. His works include: *La Terreur Blanche, Histoire de l'émigration*, and a volume of *Mémoires*. He died in Aug., 1921.

DAUD'NAGAR. A town in Gayá district, Bengal; has manufactures of cloth, carpets, and blankets. In the vicinity is a fine temple. Pop. 9870.

DAUGAVPILS. Lettish name of Dvinsk (q.v.).

DAULATÁBÁD. A town of India, in the Nizam's Dominions (Hyderabad), Deccan; 170 miles N.E. of Bombay; the fortress, also known by the name of *Deogiri*, was from remote antiquity the stronghold of the rulers of the Deccan. Pop. about 2000.

D'AULNOY. *See* AULNOY.

DAUN (doun), **Leopold Joseph Maria, Count von.** An Austrian general, was born in 1705, and died in 1766. He served in the Turkish War in 1710, as major-general in Italy in 1734, and distinguished himself at the battle of Krozka in 1737, and the capture of Dingelfingen in 1740. In 1748, after serving against the French in the Netherlands, he was made knight of the Golden Fleece.

His skilful passage of the Rhine, and his marriage with the Countess of Fux, a favourite of Maria Theresa, procured for him the post of Master-General of the Ordnance, and in 1757 that of general field-marshal. That same year he defeated Frederick the Great at Kollin, and soon after took Breslau. In 1758 he again defeated Frederick at Hochkirch; but he was at last thoroughly defeated by Frederick at Torgau in 1759. He afterwards became President of the Aulic Council.

DAU'PHIN. The title of the eldest son of the King of France prior to the revolution of 1830. The name was originally a title attached to certain seigneuries, such as Dauphin of the Viennois, Dauphin of Auvergne. The name Dauphin, borne by the lords of the Viennois, was, according to Littré, a proper name *Delphinus* (the same word as the name of the fish), whence their province was called Dauphiné. Humbert III., the last lord of Dauphiné, ceded his province to the King of France in 1349, on condition that the title of the heir-apparent to the French throne should perpetuate the title of Dauphin.

DAU'PHINY (*Dauphiné*). One of the ancient provinces of France, which comprised the modern departments of the Isère, the Hautes Alpes, and part of that of the Drôme. The capital of the whole was Grenoble.

DAUW (da'u), or **PEECHI** (*Equus Burchelli*). A species of zebra which inhabited the plains of Southern Africa, particularly to the north of the Orange River, but is now nearly extinct. Its general colour is a pale-brown, with greyish-white on the abdomen and inner parts of the limbs. Its head, neck, and body, and the upper parts of its limbs, are striped like the zebra, but the stripes are not so dark in colour. The Dutch colonists call it *Bonte-quagga*.

DAVALLIA. A large genus of Leptosporangiate ferns, section Mixtæ, mostly tropical. One distinctive feature is the two-lipped indusium. They are related on the one hand to the Dennstædtineæ, and on the other to the more advanced Mixtæ, with sporangia borne on the leaf-margin, such as Pteris and Adiantum. *D. pyxidata* is often cultivated.

DAV'ENANT, Sir William. English poet and dramatist, born at Oxford 1606, died 1668. His father kept the Crown Inn, a house at which Shakespeare used to stop on his journeys between London and Stratford. He was rumoured to have been Shakespeare's natural son; the

story was not true, but Davenant himself appears to have encouraged belief in it rather than to have denied it.

He was early introduced into court life through his service with the Duchess of Richmond and Lord Brooke; and having produced several plays and court masques, he succeeded Ben Jonson in the laureateship (1637). During the Civil War he fought on the Royal side, was made a lieutenant-general, and received the honour of knighthood. On the decline of the Royal cause he retired to France, where he became a Catholic; but attempting to sail for Virginia, his ship was captured, and he escaped death through the good offices of John Milton, a kindness he was able to repay after the Restoration.

Under Charles II. Davenant flourished in the dramatic world. His works consist of dramas, masques, addresses, and the epic *Gondibert*, an unfinished poem in 1500 heroic stanzas; but he is remembered chiefly by the travesty of Shakespeare's *Tempest*, made in conjunction with Dryden. He was buried in Westminster Abbey.

DAV'ENPORT. A city of Iowa, United States, situate at the foot of the upper rapids of the Mississippi, near Rock Island. Woollen goods, agricultural implements, and machines, etc., are among the manufactures. Pop. (1930), 60,751.

DAV'ENTRY, or **DAINTREE.** A borough, England, Northamptonshire; has extensive manufactures of whips and shoes. It contains a high-power station of the British Broadcasting Corporation. Pop. (1931), 3608.

DAVEY, Lord. English lawyer. Horace Davey was born 30th Aug., 1833, and educated at Rugby and University College, Oxford. In 1861 he became a barrister, and in 1880 Liberal M.P. for Christchurch. In 1886 and in 1892-93 he was Solicitor-General. From 1888 to 1892 he was M.P. for Stockton. In 1893 he was made a Lord Justice, and in 1894 a Lord of Appeal and a life peer as Lord Davey of Fernhurst. He died 20th Feb., 1907.

DAVID, King of Israel. The youngest son of Jesse, a citizen of Bethlehem, and descended through Boaz from the ancient princes of Judah. The life of David is recorded in the first and second books of Samuel and the first book of Chronicles. The book of Psalms, a large portion of which has been attributed to him, also contains frequent allusions to incidents in his life. He reigned from 1055 B.C. to 1015 B.C. according to the usual chronology, but recent investigations put the dates of David's reign from 30 to 50 years later. Under David the empire of the Israelites rose to the height of its power, and his reign has always been looked on by the Jews as the golden age of their nation's history.

DAVID I. King of Scotland, son of Malcolm Canmore, born in 1084; succeeded his brother Alexander I. in 1124; died 1153. He was the first to introduce feudal institutions and ideas into his native land. He twice invaded England to support his niece Matilda against Stephen, her rival claimant for the English crown; during one of his incursions he was defeated at the battle of the Standard (1138). He died at Carlisle, and was succeeded by his grandson Malcolm.

He acquired a considerable reputation for sanctity. While yet Prince of Cumbria he had begun the re-establishment or restoration of the Glasgow bishopric, and after he became king founded the bishoprics of Aberdeen, Ross, Caithness, Brechin and Dunblane. Among the religious houses for regulars which date from his reign are Holyrood, Melrose, Jedburgh, Kelso, Dryburgh, and Newbattle. His services to the Church procured for him the popular title of saint, but the endowments so taxed the royal domains and possessions that James VI. bitterly characterized him as "ane sair sanct for the crown."—Cf. A. Lang, *History of Scotland*.

DAVID II. King of Scotland. Son of Robert Bruce by his seond wife, Elizabeth de Burgh, was born 1324; succeeded to the throne 1329; died 1371. On the death of his father he was acknowledged by the great part of the nation. Edward Baliol, however, the son of John Baliol, formed a party for the purpose of supporting his pretensions to the crown; he was backed by Edward III. of England. Battles were frequent, and at first Baliol was successful; but eventually David succeeded in driving him from Scotland. Still, however, the war was carried on with England with increasing rancour, till at length David was made prisoner at the battle of Neville's Cross (1346). After being detained in captivity for eleven years, he was ransomed for 100,000 merks. The remainder of his reign was occupied in disputes with his Parliament.

DAVID, Félicien César. French musician and composer, born at Cadenet (Vaucluse) 1810, died 1876. He entered the Paris Conservatoire

in 1830, and became an ardent disciple of St. Simon, Enfantin, and other social speculators. In 1832, with a few companions, he went to the East in order to realize his dreams of a perfect life, but returned disappointed in 1835. He then published his *Mélodies Orientales*, and soon after his most successful work, *Le Désert*. Other works are: *Moïse sur le Sinaï*, *Christophe Colombe*, *Le Paradis*, *La Perle du Brésil*, *Herculaneum*, and *Lalla Roukh*. Bizet, Massenet, and Délibes were among his followers.

DAVID, Jacques Louis. The founder of the modern French school of painting, born at Paris 1748, died at Brussels 1825. He went to Rome in 1774, and passed several years there painting several important pictures. A second visit produced *The Horatii*, one of his masterpieces. In 1787 he produced *The Death of Socrates*, in 1788 *Paris and Helen*, and in 1789 *Brutus*. In the Revolution he was a violent Jacobin, and wholly devoted to Robespierre. Several of the scenes of the Revolution supplied subjects for his brush. What is considered his masterpiece, *The Rape of the Sabines*, was painted in 1799. He was appointed first painter to Napoleon about 1804; and after the second Restoration of Louis XVIII. he was included in the decree which banished all regicides from France, when he retired to Brussels.

DAVID, Pierre Jean. A French sculptor, born at Angers in 1789 (hence commonly called *David d'Angers*), died 1856. He went when very young to Paris, became the pupil of J. L. David, and in 1809 a prize obtained from the Academy enabled him to pursue his studies at Rome, where he formed a friendship with Canova. On his return to Paris he laid the foundation of his fame by a colossal statue of the great Condé in marble. He visited Germany twice, in 1828 and 1834, and executed busts of Goethe for Weimar, of Schelling for Munich, of Tieck for Dresden, of Rauch and Humboldt for Berlin.

In 1831 he began the magnificent sculptures of the Pantheon, his most important work, which he finished in 1837. He executed a great number of medallions, busts, and statues of celebrated persons of all countries, among whom are Sir Walter Scott, Canning, Washington, Lafayette, Gutenberg, Cuvier, Victor Hugo, Béranger, Paganini, and Madame de Staël.

DAVID, Saint. Patron of Wales, Archbishop of Caerleon, and afterwards of Menevia, now St. David's, where he died about A.D. 601. He was celebrated for his piety, and many legends are told of his miraculous powers. His writings are no longer extant. His life was written by Ricemarch, bishop of St. David's, in the eleventh century. His annual festival, known as St. David's Day, falls on the 1st of March.

DAVID'S, St. Ancient episcopal city, Wales, County Pembroke, near the promontory of St. David's Head, once the metropolitan see of Wales. Within a space of 1200 yards in circuit are the cathedral, chiefly of the twelfth century, with a finely decorated rood-loft, the episcopal palace, the ruins of St Mary College, and other ecclesiastical edifices, chiefly ruinous. Pop. of parish, 1644.

DAVIDSON, Baron. English archbishop. Randall Thomas Davidson was born 7th April, 1848, near Edinburgh, and was educated at Harrow and Trinity College, Oxford. In 1874 he was ordained and for three years was a curate at Dartford. In 1877 he was made domestic chaplain to the Archbishop of Canterbury, whom he served for six years. In 1883 he was appointed Dean of Windsor, in 1891 Bishop of Rochester, and in 1895 Bishop of Winchester. In 1903 he was chosen Archbishop of Canterbury, and for twenty-five years held that post, a longer period than most of his predecessors. He resigned in 1928 and was made a baron. He died 25th May 1930.

DAVIDSON, Sir James Mackenzie. British surgeon, born 6th Dec., 1856, died in London, 7th April, 1919. Educated at Buenos Aires and London, he graduated in 1882 at Aberdeen, where he became lecturer on ophthalmology. In 1897 he went to London, where he devoted his time to X-ray treatment and became an authority on radiology. Consulting surgeon to the Röntgen Ray Department, Charing Cross Hospital, he was knighted in 1912. His works include: *Röntgen Rays and Localization*, and *Localization of Foreign Bodies in Eyeball and Orbit*.

DAVIDSON, John. British poet, born at Barrhead, near Glasgow, Scotland, on 11th April, 1857, was drowned at Penzance 23rd March, 1909. Educated at Greenock and at Edinburgh, he was a schoolmaster for twelve years, and in 1890 came to London. Davidson's philosophy, derived from Schopenhauer, was thoroughly pessimistic.

His first volume of verse, *In a Music Hall, and other Poems*, appeared in 1891. Other volumes are:

Fleet Street Eclogues (1895); *New Ballads* (1896); *Testaments* (1901-2); *The Knight of the Maypole* (1902); *Holiday and other Poems* (1906); *Mammon and his Message* (1908); *The Man Forbid, and other Essays* (1910).

DAVIDSON, John Colin Campbell. British politician. Born in Aberdeen, 23rd Feb., 1889, he was the son of Sir J. M. Davidson, a noted physician there. Educated at Westminster School and Pembroke College, Cambridge, he entered political life and between 1910-20 was private secretary to a succession of ministers. In 1920 he was elected Unionist M.P. for the Hemel Hempstead division, and in 1923 was Chancellor of the Duchy of Lancaster. From 1924-26 he was Parliamentary Secretary to the Admiralty, and was chairman of the Unionist party organization from 1926 to June, 1930. In 1928 he was made a Privy Councillor.

DAVIDSON, Samuel. Biblical scholar, born in Ireland 1806, died 1898; studied at Glasgow and Belfast, entered the Presbyterian ministry, and was for a time a divinity professor at Belfast. Soon afterwards he joined the Congregationalists, and was a professor in their college at Manchester, but had to resign owing to his advanced theological views, and settled in London.

His works include: *Introduction to the New Testament*; *Introduction to the Old Testament*; *Biblical Criticism*; translation of the *New Testament*, from Tischendorf's text; *Canon of the Bible*; *Doctrine of the Last Things*.

DAVIES, Sir Henry Walford. British organist and composer. Born at Oswestry, 6th Sept., 1869, he was a chorister at Windsor and took up music as a career. After studying in London, he was appointed organist of Christ Church, Hampstead, in 1891, and in 1898 organist of the Temple Church, London. He resigned that position in 1923 to give more time to his duties as professor of music at University College, Aberystwyth. In 1924 he was chosen Gresham Professor of Music, and in 1927 organist of St. George's Chapel, Windsor. In 1922 he was knighted. Davies is known as the composer of cantatas and other music, and for his popular broadcasting talks. He was (1903-7) conductor of the Bach Choir.

DA'VIES, Sir John. English poet and lawyer, born 1569, died 1626. In 1603 he was appointed Solicitor-General for Ireland, and soon after Attorney-General. He was knighted in 1607, returned to the English Parliament in 1621, and obtained the dignity of Lord Chief Justice in 1626. He wrote *Orchestra*; *Hymns to Astrea*; *Nosce Teipsum*, a metaphysical poem and his best-known work; he is also the author of a work on the political state of Ireland. His works have been edited by A. B. Grosart, 1873. Sir John Davies must be distinguished from John Davies of Hereford (1565(?)–1618), poet and writing master, and author of *Microcosmus*, and *The Holy Roode*.

DAVIES, William Henry. English poet. Born at Newport, 20th April, 1871, he lived a wandering life in America and Britain, chiefly as tramp and pedlar. All the time he was writing poetry, and in 1906 his volume, *The Soul's Destroyer*, attracted a good deal of attention. Other volumes followed, all showing a love of nature expressed in beautiful language. These include *The Song of Love*, 1926. His prose writings include *The Autobiography of a Super-Tramp*, *A Poet's Pilgrimage* and *The Adventures of Johnny Walker, Tramp*.

DA'VILA, Enrico Caterino. An Italian historian, born near Padua in 1576, died 1631. Brought up in France, he for a time served with distinction in the French army. In 1599 he entered the Venetian service, gradually rose to the post of governor of Dalmatia, Friuli, and the Island of Candia, and was shot while on his journey to take the command of the garrison of Crema. He is principally celebrated for his *History of the Civil Wars of France from* 1559 *to* 1598 (Storia delle Guerre Civili di Francia, Venice, 1630), translated into English by W. Aylesbury, 1647.

DAVIS, Jefferson. President of the Confederate States of America during the Civil War; born in Kentucky 1808, died in 1889. He was trained at West Point Military Academy, and from 1828 to 1835 saw a good deal of service on the frontier. At the latter date he became a cotton planter in the state of Mississippi.

He was elected to Congress in 1845, but at the commencement of the Mexican War he left Congress and engaged actively in the contest. He entered the Senate in 1847, and held various posts in the Government, upholding the policy of the slave states and the doctrine of slave rights. On the outbreak of the Civil War he was chosen president of the Southern States, was taken prisoner after the fall of Richmond, imprisoned for two years in Fortress Monroe, and set at liberty by the general amnesty of 1868. He subse-

quently wrote: *Rise and Fall of the Confederate Government*, and a *Short History of the Confederate States of America*.—BIBLIOGRAPHY: F. H. Alfriend, *Life of Jefferson Davis*; W. E. Dodd, *Jefferson Davis*.

DAVIS, or **DAVYS, John.** An English navigator, born at Sandridge, in Devonshire, about 1550. Between 1585 and 1587 he conducted three expeditions for the discovery of the north-west passage. In the first he coasted round the south of Greenland and sailed across the strait that now bears his name into Cumberland Gulf, and in the third he sailed north through Davis' Strait into Baffin's Bay. He also accompanied the expedition of Cavendish to the Pacific from 1591-93, and made several voyages to the East Indies. In 1605 Davis was killed by Japanese pirates in the Indian seas near Sumatra. He wrote: *Seamen's Secrets* (a work on navigation), and *The World's Hydrographical Description*.

DAVIS CUP. Trophy contended for by international lawn tennis teams. It owes its name to Dwight Davis, an American politician. Each team consists of four men. From 1920-26 it was won by the United States, and from 1927-32 by France.

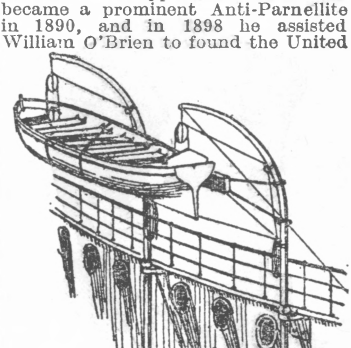
DA'VISON, William. A statesman in the reign of Queen Elizabeth, of Scottish extraction. After being employed in several important diplomatic missions to Holland and Scotland, he became Secretary of State to Queen Elizabeth in 1586. He was made the scapegoat of the other ministers for his excess of zeal in dispatching the warrant for the execution of Mary, Queen of Scots (1587). He was brought to trial, heavily fined, and imprisoned, and died in 1608 without regaining favour.

DAVIS' STRAIT. A narrow sea which separates Greenland from Baffin's Land, and unites Baffin's Bay with the Atlantic Ocean; lat. 64° to 68° N.

DA'VITS. Two projecting pieces of wood or iron on the side or stern of a vessel, used for suspending or lowering and hoisting the boats by means of sheave and pulley. They are fixed so as to admit of being shipped and unshipped at pleasure.

DAVITT, Michael. Irish journalist and conspirator, born in Straid, County Mayo, on 25th March, 1846, died at Dublin on 31st May, 1906. He was the son of peasants, and was brought up in Lancashire, where he afterwards worked in a cotton factory and lost an arm. In 1867 he joined the Fenian movement and was present at the attack on Chester Castle. In 1870, detected in the act of transporting arms to Ireland, he was sentenced to 15 years' penal servitude. Released on ticket-of-leave in 1877, he visited the United States, and in 1879 organized the Irish Land League.

Arrested in 1881, under the Coercion Act, his ticket-of-leave was cancelled, and he was again sent to Portland. He was released in 1882, but was again imprisoned for sedition in 1883. Elected to Parliament in 1882 and in 1892, he was unseated on both occasions, but was returned to Parliament unopposed in 1895. He became a prominent Anti-Parnellite in 1890, and in 1898 he assisted William O'Brien to found the United



Davits

Irish League, and in the following year he resigned from Parliament. His works include: *Leaves from a Prison Diary* (1885), *The Boer Fight for Freedom* (1902), *Within the Pale* (1903), *The Fall of Feudalism* (1904), *Pageant of London* (1905).

DAVOS (dä-vōs'). An elevated valley (over 5000 feet) of Switzerland, canton of Grisons, containing several villages; a winter resort of persons suffering from chest diseases.

DAVOUT, or **DAVOUST** (dä-vō), **Louis Nicolas.** Duke of Auerstädt and Prince of Eckmühl, marshal and peer of France, born in 1770 at Annoux, in Burgundy; died 1823. He entered the army at the age of seventeen; served with distinction under Dumouriez, and at the passage of the Rhine in 1797. He went with Bonaparte to Egypt in 1798, and commanded the cavalry of the army of Italy in 1800. He received a mar-

shal's baton in 1804, led the right wing at Austerlitz in 1805, and defeated the Prussians at Auerstädt in 1806. He shared the glory of Eylau, Eckmühl, and Wagram; was made Governor of Hamburg; took part in the Russian campaign of 1812, and was wounded at Borodino. During the Hundred Days (1815) he was Napoleon's Minister of War, and after Waterloo was appointed by the Provisional Government General-in-Chief of the French armies. In 1819 he became a member of the Chamber of Peers.

DA'VY, Sir Humphrey, Bart. Distinguished English chemist, was born

Sir Humphrey Davy, the noted English chemist

at Penzance 1778, died at Geneva 1829. After having received the rudiments of a classical education, he was placed with Dr. Beddoes, a surgeon in his native town, and early developed a taste for scientific experiments. So successful was he in his studies that he was appointed professor of chemistry in the Royal Institution at the age of twenty-four. In 1803 he was chosen a member of the Royal Society.

His discoveries with the galvanic battery, his decomposition of the earths and alkalies and ascertaining their metallic bases, his demonstration of the simple nature of the oxymuriatic acid (to which he gave the name of *chlorine*), etc., obtained him an extensive reputation; and in 1810 he received the prize of the French Institute. In 1814 he was elected a corresponding member of that body. Having been elected professor of chemistry to the Board of Agriculture he delivered lectures on agricultural chemistry during ten successive years.

The numerous accidents arising from fire-damp in mines led him to enter upon a series of experiments on the nature of the explosive gas, the result of which was the invention of his safety-lamp. He was knighted in 1812, and created a baronet in 1818. In 1820 he succeeded Sir J. Banks as president of the Royal Society, and at the time of his death he was a member of most of the scientific societies of Europe.

His mind was highly imaginative, and S. T. Coleridge is supposed to have declared that if "Davy had not been the first chemist, he would have been the first poet of his age." His health had been failing for some time, and in his last year he had gone abroad to recruit.

His most important works are: *Philosophical Researches, Elements of Agricultural Chemistry, Electro-Chemical Researches, Elements of Chemical Philosophy, Researches on the Oxymuriatic Acid, On Fire-damp.* He also contributed some valuable papers to the *Philosophical Transactions*, and was author of *Salmonia, or Days of Fly-fishing*; and *Consolations in Travel, or The Last Days of a Philosopher.*—BIBLIOGRAPHY: J. A. Paris, *The Life of Sir Humphry Davy*; T. E. Thorpe, *Humphry Davy, Poet and Philosopher.*

DAWES, Charles Gates. American diplomatist. Born in Ohio, Aug. 27, 1865, he became a lawyer and practised at Lincoln, Nebraska. Later he turned to business life, and in 1917 was appointed chairman of the purchasing board of the American army. In 1923 he represented his country when the question of German Reparations was considered. The scheme drawn up at that time was called the Dawes Plan, and provided for the payment by Germany of certain sums yearly, the total amount to be fixed later. It was operative until superseded by the Young Plan in 1929. In 1924 he was elected Vice-President of the United States on the republican ticket. When he vacated that office in 1929 he was sent as ambassador to London. He retired in 1932 to take charge of the Reconstruction Corporation, but soon returned to business life in Chicago.

DAWKINS, Professor Sir William Boyd. Geologist and archæologist, born 1838; educated at Rossall and Jesus College, Oxford; studied

geology, and was connected with the Geological Survey; became lecturer on geology in the Owens College, Manchester, 1870, and in 1879 became professor of geology and palæontology in Victoria University. He was geological adviser in connection with various engineering and mining enterprises, was president of the geologcial section of the British Association in 1888, and was knighted in 1919.

His works include: *Cave Hunting; Early Man in Britain and his Place in the Tertiary Period*, a work throwing much light on prehistoric conditions in Britain; *British Pleistocene Mammalia*. He died in 1929.

DAWLEY. An English town. Shropshire, 3¼ miles S.E. of Wellington; has extensive ironworks and coal-mines. Pop. (1931), 7363.

DAWLISH. A popular seaside resort, Devonshire, England, 3 miles N.N.E. of Teignmouth. Pop. (1931), 4578.

DAWSON, Henry. English landscape painter, born 1811, died 1878. In early life he was a worker in a Nottingham lace factory, but this occupation he gave up for art in 1835. After struggling some time at Nottingham, he removed to Liverpool in 1844, and thence to Croydon in 1850, and subsequently he resided at Chiswick. It was long before his abilities were fully recognised, and his pictures began to fetch high prices only a little before his death. Among the best of them are: *Wooden Walls of Old England, London from Greenwich Hill, Houses of Parliament, The Rainbow, Rainbow at Sea, The Pool below London Bridge.*

DAWSON OF PENN, Lord. Bertrand Edward Dawson, the first baron, studied at University College and the London Hospital. He has done much research on gastric trouble, and has published treatises on paratyphoid and infective jaundice, on which he worked during the war. He became a peer in 1920, and is Physician-in-Ordinary to the king.

DAWSON, Sir John William. Canadian geologist, born at Pictou, Nova Scotia, in 1820, died in 1899. He was educated at Pictou and Edinburgh University, and early turned his attention to geology, having published papers on the subject when not much over twenty. He accompanied Sir Charles Lyell when examining the geology of Nova Scotia in 1842 in 1850 he became Superintendent of Education for Nova Scotia, and in 1855 principal and professor of natural history in M'Gill College, Montreal, in which position, as well as in that of vice-chancellor, and principal of the university, his services in the cause of education were very marked.

He became a member of the Royal Society (London) in 1862, was knighted in 1885, and was president of the British Association in 1886 during its meeting at Birmingham. His published works include: *Acadian Geology, The Story of the Earth and Man, Science and the Bible, The Dawn of Life*, and *Geological History of Plants.*

DAWSON. A Canadian city, capital of Yukon territory, in the far north-west, near the Alaska frontier, at the junction of the Klondyke River with the Yukon, at a latitude rather farther north than that of Trondhjem or the Faroes. It owes its existence to the gold discoveries here, was founded in 1896, and is on the whole poorly built, though its appearance has been much improved by the erection of banks, hotels, and other edifices. The climate is subject to great extremes. Pop. 2000.

DAWSONIA. A genus of mosses, natives mainly of Australia. They have the habit of Polytrichum (q.v.), to which they are closely allied, but are far finer plants. *D. superba* is the largest and longest-lived of known mosses, specimens twenty years old and 18 inches high being not uncommon in the "fern-gullies" of Victoria.

DAX. A town and watering-place of South-Western France, department of Landes, on the left bank of the Adour, 25 miles N.E. of Bayonne. The chief attraction of the place is its thermal springs, which have temperatures varying from 86° to 166° F., were much frequented by the Romans and are still in great repute for the cure of rheumatic and similar complaints. Pop. 12,390.

DAY. Either the interval of time during which the sun is continuously above the horizon, or the time occupied by a revolution of the earth on its axis, embracing this interval (the period of light) as well as the interval of darkness. The day in the latter sense may be measured in more than one way. If we measure it by the apparent movement of the stars, caused by the rotation of the earth on its axis, we must call a day the period between the time when a star is on the meridian and when it again returns to the meridian: this is a *sidereal day.*

But more important than this is the *solar day*, or the interval between two passages of the sun across the meridian of any place. The latter is about 4 minutes longer than the former, owing to the revolution of the earth round the sun, and it is not of

uniform length, owing to the varying speed at which the earth moves in its orbit and to the obliquity of the ecliptic. For convenience an average of the solar days is taken, and this gives us the *mean solar* or *civil day* of 24 hours. The difference between the *mean solar*, or *mean* time, and actual solar, or *apparent* time, at any moment is called the *equation of time*. A sidereal day is equal to 23 hours, 56 minutes, 4·09 seconds of mean time.

The length of the days and nights at any place varies with the latitude and season of the year, owing to the inclination of the earth's axis. In the first place the days and nights are equal (12 hours each) all over the world on the 21st of March and the 23rd of September, which dates are called the *vernal* (spring) and *autumnal equinoxes* (Lat. *æquus*, equal, *nox*, night).

Again, the days and nights are always of equal length at the equator,

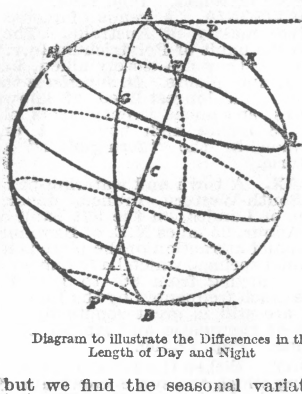


Diagram to illustrate the Differences in the Length of Day and Night

but we find the seasonal variations in length of the day becoming greater and greater as we recede from the equator. This will be easily understood from a consideration of the accompanying figure, which represents the position of the earth at the northern summer solstice. Let *SA*, *S'D*, *S''B* represent the sun's rays, then the circle *AFBG* at right angles to them will be the *circle of illumination*, that is, the line which separates the illuminated and dark hemispheres of the earth. Consider a place *F*. As the earth turns round it would describe a circle *FDGH*, the greater part of which, *FDG*, is performed in the sunlight, and the smaller part, *GHF*, in the dark. In other words, the day for the place *F* would be longer than its night.

It will be also seen that for any place within the Arctic Circle, *AK*, the sun does not set, while within the Antarctic Circle the sun never rises so long as the earth is in this position. At the northern winter solstice the reverse of all this is the case—places within the Arctic Circle never come into the light area, and places within the Antarctic Circle never enter into the dark. At both poles the year consists of one day of six months' duration, and one night of the same length.

The Babylonians began the day at sunrising; the Jews at sunsetting; the Egyptians and Romans at midnight, as do most modern peoples. The civil day in most countries is divided into two portions of 12 hours each. The abbreviations A.M. and P.M. (the first signifying *ante meridiem*, Lat. for forenoon; the latter *post meridiem*, afternoon) are requisite, in consequence of this division of the day.

For astronomical and nautical, and, more recently, for meteorological purposes, the day has been divided as a whole into 24 hours instead of into two parts of 12 hours. The arrangement of commencing the astronomical day at noon is said to have been as old as the time of Ptolemy. In this method such a time (civil) as, say, 25th October, 4.30 a.m., is expressed as 24th Oct., 16 hours, 30 minutes. Its advantage is that all the records of observations taken during one night bear the same date, with a continuously increasing time; there is no break of continuity at midnight.

There are, however, concurrent disadvantages, and frequent proposals were made to substitute a 24-hour reckoning commencing from midnight. This finally gained general acceptance among astronomers, and it was decided to introduce the new reckoning in the British Nautical Almanac as from 1st Jan., 1925. In meteorology the 24-hour system reckoning from midnight is employed, a plan which was also adopted for naval, military, and air-service use just before the close of the European War. In the future, therefore, one uniform method of expressing time will be used for all these and for astronomical purposes.

If a ship sails eastward round the world, its passengers experience one more sunrise in the course of the voyage than if they had been living at home; if it sails round westward, one less. Therefore in the former case one period of 24 hours must be counted by them twice over, and in the latter case a similar period cut out of the reckoning, to enable them to arrive home with a correct calendar date. This discontinuity is made at, or close to, the meridian of 180° long., opposite to Greenwich, where the

lendar date is suddenly put back, advanced, one day. Thus places in ie hemisphere east of Greenwich ave a time ahead of Greenwich, those the hemisphere west a time behind , in each case up to a maximum ivergence of about 12 hours. Any ay, e.g. 1st Oct., 1921, is born, so to peak, at about the meridian of 180°, t local midnight, and reaches Green- ich 12 hours later.

Fortunately this meridian passes or nearly all its length over the ocean, raversing the mid-Pacific; but where t crosses groups of islands, the islands f any such group observe for con- enience a common date, generally ccording as the group is predomin- ntly east or west of this meridian. The extreme eastern corner of Siberia, lthough beyond 180° E., naturally eeps the Asiatic date, so that here he line of demarcation bends east- vard into Behring Strait.

DAY. In law, a period of time ommencing at midnight and extend- ng to 24 hours (*dies naturalis*), or the ours between sunrise and sunset *dies artificialis*). By the Interpreta- ion Act, 1889, any Act, Order, etc., expressed to come into operation on a particular day comes into operation immediately on the expiration of the preceding day.

Dies naturalis is measured in Great Britain by Greenwich mean time, and in Ireland by Dublin mean time. Fractions are ignored in law, and, therefore, e.g. a term of imprisonment begins to run as from midnight of the day preceding its actual commence- ment notwithstanding the actual hour of the incarceration. *Dies artificialis* occurs in the law of distress and the Day Trespass Act.

DAY, John. English dramatist. Born at Cawston, Norfolk, about 1574, he went to Cambridge. He is known as the author of a dramatic allegory, *The Parliament of Bees* and *Humour out of Breath*. He wrote plays in association with Henry Chettle and Thomas Dekker before his death in 1640.

DAY, Thomas. British author, of a benevolent, independent, but ec- centric spirit, was born at London in 1748, killed by a fall from a horse 1789. His father, who was a collector of the customs, died whilst he was an infant, leaving him a considerable fortune. He was educated at the Charterhouse and at Oxford, and in 1775 he was called to the Bar. He renounced most of the indulgences of a man of fortune that he might be- stow his superfluities upon those who wanted necessaries; and he also ex- pressed a great contempt for forms and artificial restraint of all kinds.

He wrote, in prose and verse, on various subjects, such as his poem *The Dying Negro*, but the *History of Sandford and Merton* and the *History of Little Jack* are the only works by which his name is perpetuated.

DAYFLY. The popular name of those neuropterous insects which belong to the genus Ephemera. They are so called because, though they may exist in the larval and pupal state for several years, in their perfect form they exist only from a few hours to a few days, taking no food, but only propagating their species and then dying. They are also known as May-flies, from the month when they usually appear.

DAYLIGHT SAVING. A system originated by William Willett, a London builder, which consists in arbitrarily putting forward the hands of the clock for one hour on a fixed day in spring, and setting them back on another fixed day in the autumn. The advantages are an increased use of daylight in place of artificial light, and the saving of many hours of work and of the cost of illumination.

The plan, which became popular during the European War, is not a new one. In 1784 Benjamin Franklin published an article in the *Journal de Paris*, entitled *An Economical Project for Diminishing the Cost of Light*. In modern times, however, the movement was started by Willett, who wrote a small work entitled *The Waste of Daylight*. The Daylight Saving Bill, however, introduced into Parliament in 1907, failed to pass, as did similar Bills in 1909 and 1911. But in 1916 the House of Commons agreed to daylight saving as a pro- visional war measure. It was con- tinued from year to year after the conclusion of the war, until by an Act of 1925 it was ordained that Summer Time shall last from 2 o'clock in the morning of the day next following the third Saturday of April (if this is Easter Day, Summer Time comes in a week earlier) till 2 o'clock in the morning of the day next following the first Saturday in October.

DAY-LILY. The popular name for a genus of lilies (Hemerocallis), natives of temperate Asia and Eastern Europe, two species of which (*H. flava* and *H. fulva*) are grown in gardens. They have long radical leaves, and a branched few-flowered scape, with large handsome blossoms, the segments of which are united into a tube.

DAYSMAN. In English law, an arbitrator or elected judge. The term is of Anglo-Saxon origin, and was in common use in Wycliffe's day. It occurs in the Authorized Version of

the book of Job ix. 33. The Revised Version has preserved the word, giving " umpire " as an alternative.

DAYTON. A town, United States, Ohio, capital of Montgomery County, at the confluence of the Mad and Great Miami Rivers, 52 miles N.E. of Cincinnati. It is a place of great industrial activity, a centre of railway communication, and in the variety and extent of its manufactures it stands in the front rank of western towns of its size. The National Home for Disabled Soldiers and Sailors is situated there. Pop. 200,982.

DAYTONA. Seaside resort of Florida. It is on the east coast, about 50 miles south of St. Augustine. It is famous for its beach, on which motor races are run.

DEACON (Gr. *diakonos*, attendant). Ecclesiastically, a person in the lowest degree of holy orders. The office of deacon was instituted by the apostles, and seven persons were chosen at first to serve at the feasts of Christians, and distribute bread and wine to the communicants, and to minister to the wants of the poor.

In the Roman Catholic Church the deacon is the chief minister at the altar. He assists the priest in the celebration of mass, and on certain conditions can preach and baptize.

In the Church of England the deacon is the lowest of the three orders of priesthood, these being bishops, priests, and deacons. The deacon may perform all the ordinary offices of the Christian priesthood except consecrating the elements at the administration of the Lord's Supper, and pronouncing the absolution.

In Presbyterian Churches the deacon's office is to attend to the secular interests, and in Independent Churches it is the same, with the addition that he has to distribute the bread and wine to the communicants. —Cf. T. M. Lindsay, *The Church and the Ministry in the Early Centuries*.

DEACON. In Scotland, the president of an incorporated trade, who is the chairman of its meetings and signs its records. Before the passing of the Burgh Reform Act the deacons of the crafts, or incorporated trades, in royal burghs, formed a constituent part of the town council, and were understood to represent the trades as distinguished from the merchant and guild brethren. The deacon-convener of the trades in Edinburgh and Glasgow still continues to be a constituent member of the town council.

DEACONESS. A woman set apart for special service in the early Christian Church. The institution of deaconesses is based upon 1 Tim. iii. 11. In Rom. xvi. 1, Phœbe is called *diakonos*, but it is not certain whether the word bears a technical sense, or its ordinary signification of "servant." From the fourth century onwards deaconesses played an important part in Church life, especially in the Eastern Churches. In the Western Churches they were never so important, and had become extinct by the tenth century.

The order of deaconesses has been revived in modern times, in Germany in 1833, in America in 1855, and in England in 1847. A bishop first formally ordained a deaconess in 1861, and in 1897 the Lambeth Conference recognized the order, while repudiating all members not set apart by a bishop. Deaconess institutions were established by the Church of Scotland in 1887.

DEAD-EYES. In ships, round flattish wooden blocks, encircled by a rope or an iron band, used to extend the shrouds and stays, and for other purposes.

DEAD-LETTER. A letter which lies for a certain period uncalled for at the post office, or one which cannot be delivered from defect of address, and which is sent to the general post office to be opened and returned to the writer. The department which deals with such letters is now called the *Returned Letter Office*.

DEAD-LIGHTS. Strong wooden or metal shutters fitted on the outside of the cabin windows of a vessel, so as to close them tightly in bad weather.

DEADLY NIGHTSHADE. Plant found in Great Britain and elsewhere. It grows in shady spots and bears reddish flowers and small black berries. The root, leaves, and berries are very poisonous. Atropine and belladonna are prepared from the leaves and root. The plant is sometimes called the belladonna.

DEAD MEN'S FINGERS. Popular name for a coral zoophyte, *Alcyonium digitatum*. It is frequently cast up on British coasts. The pink, spongy-looking masses are studded with tentacled polyps, which do not harden into solid skeletons. The word also refers to the spotted orchis, *O. maculata*, or marsh orchis, *O. latifolia*, with pale hand-like tubers. Shakespeare mentions them in *Hamlet*, iv. 7.

DEAD-NETTLE. The common name of the species of plants of the genus Lamium, nat. ord. Labiatæ, from the resemblance of their leaves to those of the nettle, though they have no stinging property. There are several species found in Britain (and now also in North America), as

the white dead-nettle (*L. album*), the red (*L. purpurĕum*), and the yellow (*L. Galeobdŏlon*).

DEAD RECKONING. The calculation of a ship's place at sea without any observation of the heavenly bodies. It is obtained by keeping an account of the distance which the ship has run by the log, and of her course steered by the compass, and by rectifying these data by the usual allowance for drift and leeway, according to the ship's known trim.

DEAD SEA (Lat. *Lacus Asphaltītes*; Ar. *Bahr Lut*, "the Sea of Lot"), called in Scripture "Salt Sea," "Sea of the Plains," and "East Sea," a celebrated lake in Asia, near the south extremity of Palestine, amid grand and striking scenery. The north extremity is 25 miles E. of Jerusalem, and 10 miles S.E. of Jericho; length, north to south, about 46 miles; breadth at the widest part, 9 to 10; average, about 8½ miles.

The basin or hollow in which the Dead Sea reposes forms the south termination of the great depression through which the Jordan flows, that river entering it at its north extremity. It receives several other tributaries, but has no outlet. The surface is 1312 feet below the level of the Mediterranean, and 984 feet below Lake Tiberias, from which the Jordan issues. It lies deeply imbedded between lofty cliffs of naked limestone, its shores presenting a scene of indescribable desolation and solitude, encompassed by desert sands, and bleak, stony, salt hills. Sulphur and rock-salt, lava and pumice, abound along its shores.

The water is nauseous to the taste and smell, and so buoyant that the human body will not sink in it. At about a third of its length from the north end it attains a maximum depth of 1308 feet. The southern portion is a mere lagoon, 12 feet deep in the middle and 3 feet at the edges.

It was long assumed that this lake did not exist before the destruction of Sodom and the other "cities of the plain," and that, previously to that time, the present bed of the lake was a fertile plain, in which these cities stood, and was then merely traversed by the Jordan, which, in accordance with this theory, was supposed to hold on its course to the Red Sea. This theory has been shown to be untenable.

No animals exist in its waters. Asphalt and salt are collected in small quantities, and small steamers have been put on the lake. The first to navigate the sea in modern times was an Irish traveller, named Costigan, in 1835.

DEAD'S PART. In Scots Law, that part of a person's moveable (personal) estate of which the law allows unfettered testamentary disposal. Thus if a person be survived by spouse or children, such may legally claim one-half of the deceased's moveable estate, and dead's part is one-half; and if by spouse and children, the spouse may claim one-third and the children one-third, and dead's part is also one-third. In other cases dead's part is the whole.

DEAF AND DUMB, or DEAF-MUTES. Persons both deaf and dumb, the dumbness resulting from deafness which has either existed from birth or from a very early period of life. Such persons are unable to speak simply because they have not the guidance of the sense of hearing to enable them to imitate sounds. Two causes assigned for congenital deafness are consanguineous marriages and hereditary transmission. Acquired or accidental deafness, which occurs at all ages, is frequently due to such diseases as smallpox, measles, typhus, paralysis, hydrocephalus, meningitis, and other cerebral affections, but more particularly to scarlet fever, which is somewhat apt to leave the patient deaf owing to the inflammatory state of the throat extending to the internal ear, and thus causing suppuration and destruction of the extremely delicate parts of the auditory apparatus. In the greater proportion of congenital deaf-mutes no defect is visible, or can be detected by anatomical examination, and no applications yet discovered appear to be useful.

Methods of Instruction.—The two chief methods of conveying instruction to the deaf and dumb are by means of the manual alphabet, and by training them to watch the lips of the teacher during articulation. The deaf can be taught to speak. The parents of a deaf child should lose no time in applying to the local Education Authority, when they will be told whether the child should attend school, or, if too young, how he should be dealt with at home.

Deaf children can be taken into school from the age of three, but if the home conditions are good, they may be better at home till four or five years of age. The parents will be told to avoid making signs to the child but to speak to him instead, using few and simple words, and above all, making sure that the child's eyes are upon the speaker's face at the moment of speaking. In

this way the child gets into the habit of looking to the face for communication.

When he goes to school with this habit and faculty of lip-reading, crude through it may be, he will soon make excellent progress, and speech will be added to his steadily increasing lip-reading. This is called the oral method of teaching the deaf, and it yields the best result, namely, the deaf are enabled to read the lips of their hearing brothers, who in turn are able to hear and understand the speech of the deaf.—BIBLIOGRAPHY: Horne, *Hereditary Deaf-mutism*; Winnie, *History and Handbook of Day Schools for the Deaf and Blind*; T. Arnold, *Education of Deaf-mutes*.

DEAFNESS. The partial or total inability to hear. This is a symptom of most affections of the ear. It may be due simply to an accumulation of wax. If it come on suddenly without pain in a healthy person, this is probably the cause. When it comes on with a cold in the head, it is the result of a cold or catarrh, and is likely to pass off in a few days. Attended by pain, ringing in the ears, and other similar symptoms, some degree of inflammation is likely present.

The most intractable form of deafness comes on very gradually and painlessly, and is connected with disease of the middle ear. If a skilled ear-surgeon were consulted in time, much might probably be done to stay its progress. Deafness due to the disease of the nerve of hearing is usually very intense, comes on suddenly or advances very rapidly, and is not easily reached by treatment.

DEÁK (dā'ăk), **Franz.** Hungarian statesman, born of a noble Magyar family 1803, died 1876. He was elected to the National Diet in 1832, and became the leader of the Liberal party. At the revolution of 1848 he became Minister of Justice, but retired when Kossuth obtained power. On the defeat of the patriots in 1849 he retired from public life, and did not return till the Franco-Austrian war give him an opportunity of serving his country. He is regarded as the master-spirit of the movement by which the ancient independence of his country was restored in 1867. Though the leader of the Liberal party, he constantly refused office, but no change in the ministry was made without his consent.

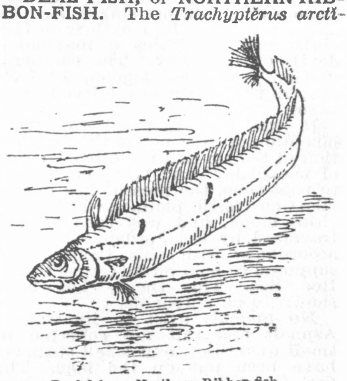
DEAKIN, Alfred. Australian politician. Born at Melbourne, 3rd Aug., 1865, he was educated there and became a lawyer. In 1878 he was elected to the legislature of Victoria, and from 1883-86 he was minister of public works and Solicitor-General. From 1886-90 he was State Secretary. He worked for the federation of Australia, and in 1900 became Attorney-General and a leading member of the first federal cabinet. In 1903 he followed Barton as prime minister, a post to which he returned in 1905. He resigned in 1908, but was again premier for a short time in 1909. He died 7th Oct., 1919.

DEAL (dēl). A seaport and watering-place, situated in Kent, England, between the North and South Foreland, 72¾ miles E. by S. of London. Walmer Castle, in which the Duke of Wellington died in 1852, Sandown Castle, and Deal Castle are in the vicinity of the town. Boat-building and sail-making are carried on. Some authorities believe that Julius Cæsar, with 82 ships and two legions, landed at Deal in 55 B.C. Pop. (municipal borough), 13,680 (1931).

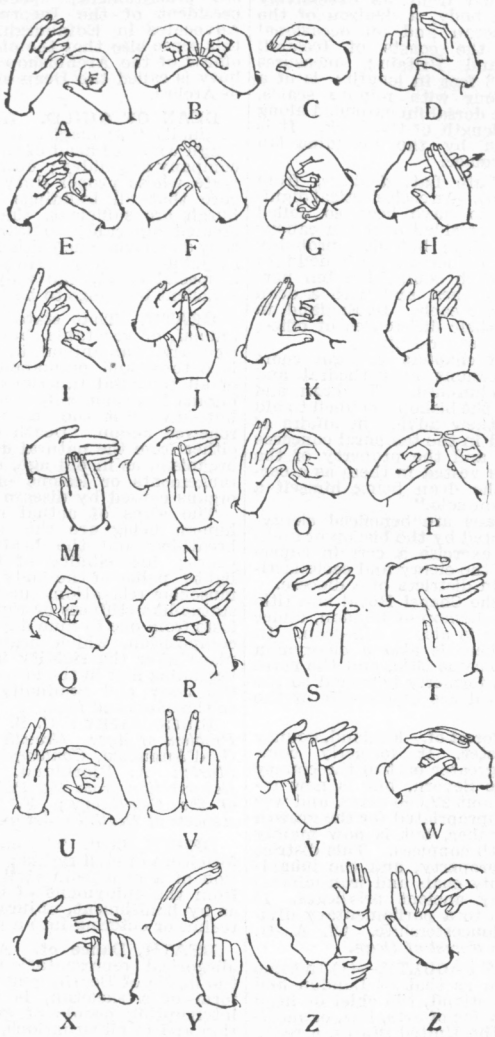
DEAL. The division of a piece of timber made by sawing; a board or plank. The name deal is chiefly applied to boards of fir above 7 inches in width and of various lengths exceeding 6 feet. If 7 inches or less wide, they are called *battens*, and when under 6 feet long, they are called *deal-ends*. The usual thickness is 3 inches, and width 9 inches. In North America the standard size, to which other sizes may be reduced, is 2½ inches thick, 11 inches broad, and 12 feet long.

Whole deal is deal which is 1¼ inches thick; *slit deal*, half that thickness. Deals are exported from Prussia, Sweden, Norway, Russia, and British North America.

DEAL-FISH, or NORTHERN RIBBON-FISH. The *Trachyptĕrus arcti-*



Deal-fish, or Northern Ribbon-fish



MANUAL ALPHABET OF THE DEAF AND DUMB

cus, so called from its excessively compressed body, a denizen of the northern ocean and an occasional visitor to the coasts of Iceland, Norway, and Britain; measures from 4 to 8 feet in length; is of a silvery colour with minute scales, and has the dorsal fin extended along the whole length of the back. It is also known by the Scandinavian name Vaagmaer.

DEAN (Late Lat. *decānus*, from Gr. *deka*, ten). An ecclesiastical dignitary, said to have been so called because he presided over ten canons or prebendaries; but more probably because each diocese was divided into deaneries, each comprising ten parishes or churches, and with a dean presiding over each. In England, in respect of their differences of office, deans are of several kinds.

Deans of chapters are governors over the canons in cathedral and collegiate churches. The **dean and chapter** are the bishop's council to aid him with their advice in affairs of religion and in the temporal concerns of his see, and the property of the cathedral is vested in them as a corporation, the dean being himself a "corporation sole."

Rural deans are beneficed clergymen appointed by the bishop or archdeacon to exercise a certain supervision over the clergy and ecclesiastical affairs in districts of a diocese.

Dean of the Chapel Royal is a title held by the Bishop of London, under whom there is also a sub-dean. In Scotland there is also a clergyman holding the same title, and the revenues which formerly belonged to the Chapel Royal are in the gift of the Crown.

DEAN, Forest of. England, county of Gloucester. It formerly comprised the greater part of the county west of the Severn, but is now reduced to about 22,000 acres, and was formerly appropriated for the growth of navy timber, but is now mainly covered with coppices. This district is Crown property, and the inhabitants (chiefly coal- and iron-miners) enjoy many ancient privileges. It gives name to a parliamentary division of Gloucestershire. Cf. A. O. Cooke, *The Forest of Dean*.

DEAN OF FACULTY.—(1) In some universities, as that of London and those of Scotland, the chief or head of a faculty (as of arts, law, or medicine); in the United States, a registrar or secretary of the faculty in a department of a college, as in a medical, theological, or scientific department.

(2) The president for the time being of an incorporation of barristers or law practitioners; specifically, the president of the Incorporation of Advocates in Edinburgh. It is in this sense also that the chief judicial officer of the Archbishop of Canterbury is called the Dean of the Court of Arches.

DEAN OF GUILD. In Scotland, originally that magistrate of a royal burgh who was head of the merchant company or guildry; now the magistrate whose proper duty is to take care that all buildings within the burgh are sufficient, that they are erected agreeably to law, and that they do not encroach either on private or public property. He presides over a special court, and may order insufficient buildings to be taken down.

DEATH. That state of a being, animal, or vegetable, but more particularly of an animal, in which there is a total and permanent cessation of all the vital functions, when the organs have not only ceased to act, but have lost the susceptibility of renewed action. Death takes place either from the natural decay of the organism, as in old age, or from derangements or lesions of the vital organs caused by disease or injury.

The signs of actual death in a human being are the cessation of breathing and the beating of the heart; insensibility of the eye to light; pallor of the body; complete muscular relaxation, succeeded by a statue-like stiffness or rigidity which lasts from one to nine days; and decomposition, which begins to take place after the rigidity has yielded, beginning first in the lower portion of the body and gradually extending to the chest and face.

BIBLIOGRAPHY: C. S. Minot, *The Problem of Age: Growth and Death*; G. d'Annunzio, *Contemplazione della Morte*; A. Bjorklund, *Death and Resurrection from the Point of View of the Cell-theory*; F. D. Weber, *Aspects of Death in Art and Epigram*.

DEATH, Civil. The entire loss or forfeiture of civil rights; the separation of a man from civil society, or from the enjoyment of civil rights, as by banishment, abjuration of the realm, or entering into a monastery.

DEATH, Dance of. A grotesque allegorical representation in which the figure of Death, generally in the form of a skeleton, is represented interrupting people of every condition and in all situations, and carrying them away; so called from the mocking activity usually displayed by the figure of Death as he leads away his victims.

It was frequently drawn by artists of the Middle Ages for cemeteries and

cloisters. These representations were common in Germany, and also in France, where they received the name of *Danse Macabre*, the derivation of which has been much disputed. The series attributed to Hans Holbein, the younger, was first published at Lyons in 41 plates, increased in a subsequent edition by 12 additional plates.

A remarkable *Dance of Death* was painted, in fresco, on the walls of the churchyard in the suburb of St. John at Basel, which was injured, in early times, by being washed over, and is now entirely destroyed. This piece has been ascribed to Holbein; but it has long since been proved that it existed sixty years before his birth. The *Dance of Death* has also been treated in music (*Danse Macabre*, by Saint-Saëns) and in literature (Goethe's ballad *Der Todtentanz*).—BIBLIOGRAPHY: Douce, *The Dance of Death*; Langlois, *Essai sur les danses des morts*.

DEATH DUTIES. Duties or charges payable to the Crown on property passing at death. They include Estate Duty, Settlement Estate Duty (not chargeable in respect of deaths after 11th May, 1914), Legacy Duty, and Succession Duty; but are not levied on estates not exceeding £100 gross value. Further, if the net value does not exceed £1000 and estate duty has been paid, the remaining duties are not exigible.

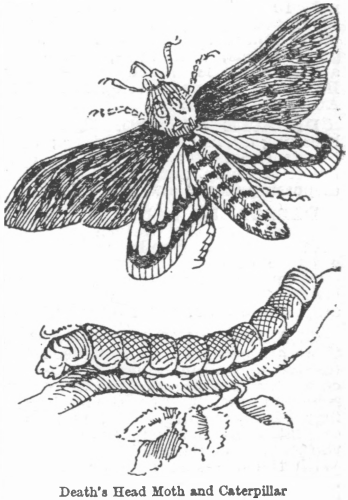
Estate duty, first imposed in 1894, is chargeable on the net value of the property, real or personal, passing on the death of any person, according to a scale now rising from 1 per cent. on estates between £100 and £500 to 40 per cent. on estates exceeding £2,000,000. On small estates exceeding £100 but not £300, and exceeding £300 but not £500, gross value, fixed duties of 30*s.* and 50*s.* respectively may be paid in lieu of the *ad valorem* duty. Estate duty is not payable on the property of common seamen, marines, or soldiers who are killed or die in His Majesty's service.

By the Death Duties (Killed in War) Act, 1914, and the Finance Acts, 1918 and 1919, it is provided that where death occurs from wounds inflicted, accident occurring, or disease contracted within three years before death while on active service in the late war, or in the course of operations arising directly or indirectly out of it but after its termination, the whole of the death duties be remitted if the deceased's estate passing to his widow, lineal descendants, lineal ascendants, or brothers and sisters and their descendants, does not exceed £5000, and that otherwise no duties be levied on the first £5000, and in respect of the excess an allowance based on the expectation of life of a person of the age of the deceased at the time of his death be made.

The net yield from these duties now exceeds £40,000,000 per annum. *See* LEGACY DUTY; SUCCESSION DUTY.

DEATH-RATE. The proportion of deaths among the inhabitants of a town, country, etc. In Britain it is usually calculated at so many per thousand per annum, and is now about 14·6.

DEATH'S-HEAD MOTH. The largest species of lepidopterous insect



Death's Head Moth and Caterpillar

found in Britain, and systematically known by the name of *Acherontia atrŏpos*. The markings upon the back of the thorax very closely resemble a skull, or death's-head; hence the English name. It measures from 4 to 5 inches in expanse. The caterpillars feed on the flowers and leaves of the potato, and also on the jessamine, and the pupal stage is passed through in the soil.

It emits peculiar sounds, somewhat resembling the squeaking of a mouse, but how these are produced naturalists have not been able satisfactorily to explain. It attacks bee-hives, pillages the honey, and disperses the inhabitants. It is regarded by the superstitious as the forerunner of death or other calamity.

DEATH-WATCH. The popular name of two minute beetles of the genus Anobium, which live in and destroy woodwork. *A. striatum* is the cause of "worm-eaten" furniture, and the larger *A. tessellatum* tunnels in the beams of public buildings. In calling to one another they strike their heads against the wood, making a peculiar ticking sound, which superstition has interpreted as a forerunner of death. The term Lesser Death-watch is given to two very minute neuropterous insects (*Atropos divinatoria* and *Clothilla pulsatoria*), which are also alleged to make ticking sounds.

DEAUVILLE. Watering-place of France. It is on the English Channel, 10 miles from Havre, and is separated from Trouville by the little River Touque. The place, which has good hotels, golf links, and other attractions, is much visited by Britons. A race meeting is held in August. Pop. 4210.

DÉBÂCLE (dā'ba-kl). A sudden breaking up, as of ice in a river; used by geologists for any sudden outbreak of water, hurling before it and dispersing stones and other debris.

DEBATABLE LAND. A district of country on the western border of Scotland and England for a long time a cause of contention between the two countries and a refuge for outlaws. Its boundaries were finally adjusted in 1552. *See* BORDERS, THE.

DEBEN'TURE (Lat. *debentur mihi*, there are owing to me). A deed-poll (declaratory deed) given by a public company in acknowledgment of borrowed money. It gives the holder the first claim for dividends, while the capital sum lent is usually assured on the security of the whole undertaking. With the deed, coupons or warrants for the payment of interest at specific dates are generally issued.

Debentures may be divided into two main classes: debentures payable to the registered holder, and debentures payable to bearer. In some cases the debentures are to bearer with an option to convert them into registered debentures, if the holders so desire. Debentures to bearer of a British company are negotiable, unless there is some condition in the debenture itself which restricts its negotiability. Custom-house certificates of drawback are also termed debentures.

DEB'ORAH. A Hebrew seer or prophetess who lived in the time of the judges, by the aid of Barak delivered the northern tribes from the oppression of Jabin, and secured a peace of forty years' duration. The triumphal ode (Judges, v.) attributed to her is a remarkable specimen of Hebrew poetry.

DEBRA TABOR. A town in Abyssinia, about 35 miles E. of Lake Dembea, at one time the residence of the Abyssinian sovereign.

DEBRECZIN (de-bret'sin). A town of Hungary, on the edge of the great central plain, 113 miles E. of Budapest. Its houses are mostly of a single story; the streets broad and unpaved. Among the principal edifices are the Protestant church and the university, founded in 1912. Chief manufactures are coarse woollens, leather, soap, tobacco-pipes and casks, and a large trade is done in cattle. Debreczin is considered the headquarters of Hungarian Protestantism. Pop. 117,410.

DEBRETT, John. English publisher, born about 1752, in 1781 he took over the business carried on in Piccadilly, London, by John Almon. Almon had already issued in 1754 a *New Peerage*, and this was turned by Debrett into *Debrett's Peerage and Baronetage*. He died 15th Nov., 1822.

DEBT (Lat. *debitum*, from *debere*, to owe). In English law, an ascertained sum of money owed by one person (debtor) to another (creditor). There are three main classes: (*a*) debts of record, arising by judgment of a court of record; (*b*) specialty debts, due under formal deed, but not necessarily for consideration; and (*c*) simple debts, constituted verbally, by informal writing, or by a course of conduct, and for due consideration.

Right of action on a specialty debt lapses after twenty years; on a simple debt after six years. The running of the period of prescription is interrupted by subsequent written admission of indebtedness, payment to account, or payment of interest. The debtor must, on the due date, offer payment in legal tender. Part payment does not operate discharge, even if the creditor agrees, unless made in other than legal tender.

DEBUSSY, Claude Achille. French musical composer, born at St. Germain-en-Laye on 22nd Aug., 1862, died 26th March, 1918. He studied at the Conservatoire, and carried off the Grand Prix de Rome in 1884 with *L'Enfant Prodigue*. Having visited Russia, he became an enthusiastic admirer of the music of Moussorgsky, and henceforth renounced Wagner, whose music had moved him to tears at Bayreuth.

His compositions include music for orchestra and piano, and his best-known works are the opera *Pelléas et*

Mélisande (1902), and *L'Après-midi d'un Faun*, the first of which marked him as a leader of the new French school of music. Other works are: *La Mer* (1905); *Jeux*, a ballet (1913); *Crimen Amoris*, a ballet (1914); *Chimène*; and *Le Diable au Beffroi*. Although Debussy was a pioneer, or rather on account of this fact, his music is not always intelligible to the larger public.

DECADE (dek'ād; Lat. *decas, decadis*; Gr. *dekas*, from *deka*, ten). Sometimes used for the number ten, or for an aggregate of ten. The books of Livy's Roman history are divided into decades. In the French Revolution decades, each consisting of ten days, took the place of weeks in the division of the year. The term is now usually applied to an aggregate of ten years.

DECA'DENCE. A term used with reference to works of art or literature belonging to a race, nation, or school artistically in decline. The works of art produced in Greece after 300 B.C., in Rome after A.D. 150, and in Italy after the Renaissance in the early sixteenth century, all belong to periods of decadence.

DECALOGUE (dek'a-log; Gr. *deka*, ten, and *logos*, a word). The ten commandments which were given by God to Moses on two tables. The Jews call them the *ten words*. The Decalogue has come down to us in two versions which differ to a considerable extent, one (in common use) being in Exod. xx., the other in Deut. v. Jews and Christians have divided the ten commandments differently; and in some Catholic catechisms the second commandment has been united with the first, and the tenth has been divided into two. The Decalogue brings prominently forward the characteristically *social* nature of both ethics and religion.—Cf. W. H. Campbell, *Lessons on the Ten Commandments*.

DECAMERON. Collection of tales written by Boccaccio. The idea is much the same as that of Chaucer's *Canterbury Tales*, some of which are borrowed from Boccaccio, who in turn, borrowed from other writers. During the plague in Florence in 1348 certain persons left the city and stayed for ten days in an inn. Here they told the stories. Boccaccio wrote the book about 1350. The first English translation was made in 1620.

DECAMPS (dē-kăn), **Alexandre Gabriel.** An eminent French painter, was born in Paris in 1803, killed while hunting at Fontainebleau, 1860. His paintings include pictures of Oriental scenery and character, historical pictures, genre pictures, and animals. The best known of all his works is *The Monkey Experts*.

DE CANDOLLE (dē kăn-dol), **Augustin Pyrame.** One of the most illustrious of modern botanists, whose natural system of classification, with some modifications, is the one still generally used, was born at Geneva in 1778, died there 1841. He took up the study of medicine at Geneva and Paris, where he attracted the notice of Cuvier and Lamarck, whom he aided in various scientific researches. After returning to his native city, he again visited Paris, and took his medical degree, selecting as the subject of his thesis the medical properties of plants.

In 1804 he lectured in the Collège de France on vegetable physiology; and the following year published an outline of his course, under the title of *Principes de Botanique*, prefixed to the third edition of Lamarck's *Flore Française*. In this outline he laid the basis of the system of classification which he afterwards developed in larger and more celebrated works. In 1808 he obtained the chair of botany in the faculty of medicine at the University of Montpellier. In 1816 he returned to Geneva, where a chair of natural history was expressly created for him, and where he continued for many years to extend the boundaries of his favourite science by his lectures and publications.

His chief works are: *L'Histoire des Plantes Grasses*, *Regni Vegetabilis Systema Naturale* (incomplete), *Théorie Élémentaire de Botanique*, *Organographie Végétale*, *Physiologie Végétale*, and *Prodromus Systematis Naturalis*, the last completed by his son Alphonse (1806–93), also an eminent botanist and member of the French Institute.

DECAP'ODA (Gr. *deka*, ten, and *pous, podos*, a foot).—(1) The highest ord. of crustaceans, so called from having five pairs of legs. They are subdivided into Brachyura, the short-tailed decapods or crabs; Macrura, or long-tailed, including the shrimp, lobster, prawn, and cray-fish; and Anomura, of which the hermit-crab is an example.

(2) One of the two divisions of the dibranchiate cuttle-fishes (the other being the Octopoda). They have two arms longer than the other eight, and bearing suckers only at the extremities.

DECAP'OLIS. A district of ancient Palestine containing ten cities, partly on the east, partly on the west of the Jordan. Among the cities of the Decapolis of special interest are Damascus and Gadara.

DECA'TUR, Stephen. American naval commander, born 1779, killed in a duel 1820. Among the chief exploits of his life were the capture of the British frigate *Macedonian* in 1812; his attempted escape from the blockade of New York harbour, 1813–1814; and his chastisement of the Algerines, 1815.

DECA'TUR. A city and important railway centre of Illinois, United States, 39 miles E. of Springfield. It has a large rolling-mill, and is a place of considerable trade. Pop. 57,510.

DECAZEVILLE (dē-käz-vēl). A town of France, department of Aveyron, with coal- and iron-mines and large ironworks. Pop, 14,260.

DEC'CAN (Skt. *Dakshina*, the south). A term locally limited to the territory of India lying between the Narbada and the Kistna, but generally understood to include the whole country south of the Vindhya Mountains, thus comprising the Presidency of Madras and part of Bombay, Hyderabad, Mysore, Travancore, and other native states.

DECEASED WIFE'S SISTER, Marriage with. A union that was made lawful in the United Kingdom by an Act of 1907, after it had been much discussed. Such marriages being legal in the Australian colonies, and in Canada (besides other countries), there was a certain anomaly in their being illegal in the home country. A later Act of 1921 has the corresponding effect shown by its title, the Deceased Brother's Widow's Marriage Act, 1921. A clergyman may not be compelled to perform the ceremony, but in such cases he can allow another minister to use his church.

DECEB'ALUS. The name of several Dacian kings, or perhaps a general title of honour borne by them. One of them distinguished himself by his opposition to the Roman arms during the reigns of Domitian and Trajan. He entered the province of Mœsia, defeated and killed Appius Sabinus, the Roman Governor, and captured many important towns and fortresses. Domitian agreed to pay him a yearly tribute, which was continued by Nerva, but refused by Trajan, who subdued Dacia, and Decebalus, to escape falling into the hands of the victors, committed suicide.

DECEIT. In law, wilful or reckless misrepresentation whereby it is intended to induce a person to believe in a supposed state of things, and to act on that belief, and he does so act to his prejudice. In such case an action of damages will lie against the deceiver. *See* FRAUD.

DECEM'BER. The twelfth month of our year, from the Lat. *decem*, ten, because in the ancient Roman year it constituted the tenth month, the year beginning with March. In December the sun enters the Tropic of Capricorn, and passes the winter solstice.

DECEM'VIRS, or **DECEMVIRI.** The ten magistrates who had absolute authority in ancient Rome (451–449 B.C.). *See* APPIUS CLAUDIUS.

DECID'UOUS. A term applied in botany to various organs of plants, particularly leaves, to indicate their annual fall. A tree of which the leaves fall annually is called a deciduous tree, and the same term is applied to the leaves themselves. The term is also applied in zoology to parts which fall off at a certain stage of an animal's existence, as the hair, horns, and teeth of certain animals.

DECIMALS. A number is expressed decimally by means of subdivisions of the unit into tenths, hundredths, etc. A point placed after the units figure shows where the subdivision begins. Thus 35·678 = 3 tens, 5 units, 6 tenths, 7 hundredths, 8 thousandths. Decimals are added and subtracted by arranging the numbers with their points directly underneath one another and carrying one for every ten.

35·678	23·232
23·235	15·844
Sum = 58·913	Difference = 7·388

Multiplication and division proceed with whole numbers if the position of the point in the answer be fixed at the start.

$$35{\cdot}678 \times {\cdot}00352 = {\cdot}035678 \times 3{\cdot}52.$$
$$35{\cdot}678 \div {\cdot}00352 = \quad 35678 \div 3{\cdot}52.$$

By arranging the multiplier and divisor to have one figure in front of the point (called the standard form), the position of the point in the answer is clearly seen because the multiplier or divisor lies between two consecutive small whole numbers (in this case 3 or 4). Large and small numbers are often expressed in this way:

$$92{,}890{,}000 = 9{\cdot}289 \times 10^7.$$
$$0{\cdot}00056 = 5{\cdot}6 \div 10^4 = 5{\cdot}6 \times 10^{-4}.$$

If weights and measures as well as money be decimalized, calculations of costs are simple exercises in multiplication and division. Thus, for example, 2 tons, 15 cwt. 84 lb. at £3, 15*s.* 6*d.* per ton = 2·7875 tons at £3·775 = £10·5228 = £10, 10*s.* 5¼*d.*

DECIMAL SYSTEM. The name given to any system of weights, measures, or money in which the unit

is always multiplied by 10 or some power of 10 to give a higher denomination, and divided by 10 or a power of 10 for a lower denomination. *See* METRIC SYSTEM.

DECIMATION. The selection of the tenth man of a corps of soldiers by lot for punishment, practised by the Romans. Sometimes every tenth man was executed; sometimes only one man of each company, the tenth in order. The term is frequently used in a loose way for the destruction of a great but indefinite proportion of people, as of an army or inhabitants of a country.

DECIUS, Gaius Messius Quintus Trajanus. A Roman emperor, who reigned from A.D. 249 to A.D. 251. He persecuted the Christians, and perished with his army in a battle near Abritum against the Goths.

DECLARATION. An avowal or formal statement; especially a simple affirmation substituted in lieu of an oath, solemn affirmation, or affidavit, which English law allows in a variety of cases, such as those which relate to the revenues of customs or excise, the post office, and other departments of administration. Justices of the peace and notaries are also empowered in various cases to take voluntary declarations in lieu of oaths, solemn affirmations, and affidavits.

Declaration of Independence.—The solemn declaration of the Congress of the United States of America, on 4th July, 1776, by which they formally renounced their subjection to the government of Britain.

Declaration of London.—A code drawn up in 1909 by the powers for the use of an International Prize Court at the Hague, to which great objections were taken at the time in Great Britain, as tending to destroy the maritime power of the country. On 8th July, 1916, an Order in Council was published, repudiating the Declaration of London.

Declaration of Paris.—An instrument signed at the Congress of Paris 1856, and subsequently accepted by the chief powers. It declared (1) privateering to be abolished; (2) a neutral flag covers enemy's goods, with the exception of contraband of war; (3) neutral goods, except contraband of war, are not liable to capture under an enemy's flag; and (4) blockades, in order to be binding, must be effective

Declaration of Rights, or Bill of Rights. *See* BILL.—Cf. Sir T. Barclay, *Problems of International Practice and Diplomacy.*

Declaration of War.—The formal notice which by the usage of nations belligerents are expected to give before commencing hostilities.

DECLAR'ATOR. A form of action in the Scottish Court of Session by which some right of property or of status is sought to be judicially declared, leaving the legal consequences of the fact to follow as a matter of course. Actions of declarator other than declarators of marriage and nullity of marriage and those involving the personal status of individuals are now competent in the Sheriff Courts.

DE CLIFFORD, Baron. English title, one of the oldest in the peerage. It was given in 1299 to Robert de Clifford. His family became extinct in 1605, and the barony was in abeyance until 1691. In 1721, having been held by the Tuftons, it again fell into abeyance, as it did in 1775 and 1832. In 1832 it came to Sophia, wife of John Russell, a descendant of the Southwells, who held it from 1776 to 1832, and in that family it has since remained.

DECLINATION. In astronomy, the distance of a heavenly body from the celestial equator (equinoctial), measured on a great circle passing through the pole and also through the body. It is said to be north or south according as the body is north or south of the equator. Declination corresponds to terrestrial latitude. Declination and right ascension specify the position of a point on the celestial sphere, as do latitude and longitude on the terrestrial.

Declination of the compass needle, or *magnetic declination*, is the variation of the magnetic needle from the true meridian of a place. This is different at different places, and at the same place at different times. The declination at London was 11° 15′ E. in 1576, 0° in 1652, 19° 30′ W. in 1760, 24° 27′ W. (its maximum) in 1815, 19° 15′ W. in 1870, 16° 19′ W. in 1903, and 14° 8′ W. in 1920.

DECLINOM'ETER. An instrument for determining the magnetic declination, and for observing its variations. In magnetic observatories there are permanent instruments of this kind, and they are now commonly made self-registering. Such instruments register the small hourly and annual variations in declination, and also the variations due to *magnetic storms*.

DECOMPOSITION, Chemical. The breaking down of a compound into simpler substances or into elements. Decomposition is induced by some external factor. Thus, heat may cause decomposition, light, percussion, the introduction of bacteria, or exposure to air. Limestone on heating

is decomposed into calcium oxide (quicklime) and carbon dioxide; some salts of silver are decomposed by light—use is made of this in photography; mercury fulminate is broken up by percussion; and sugars are decomposed into alcohol and carbon dioxide by means of enzymes present in the yeast-cell and other organisms.

The process of decay of animal and vegetable substances is a process of decomposition; the weathering of rocks is also a process of decomposition brought about by exposure of the rocks to air, moisture, and sudden changes of temperature.

DEC'ORATED STYLE. In architecture, the second style of pointed (Gothic) architecture, in use in Britain from the end of the thirteenth to the beginning of the fifteenth century, when it passed into the Perpendicular. It is distinguished from the Early English style, from which it was developed, by the more flowing or wavy lines of its tracery, especially of its windows, by the more graceful combinations of its foliage, by the greater richness of the decorations of the capitals of its columns, and of the mouldings of its doorways, niches, and finials, and generally by a style of ornamentation more profuse and naturalistic, though perhaps somewhat florid. The most distinctive ornament of the style is the ball-flower, which is usually inserted in a hollow moulding. (*See* BALL-FLOWER.)

The Decorated style has been divided into two periods, viz. the *Early* or *Geometrical Decorated* period, in which geometrical figures are largely introduced in the ornamentation; and the *Decorated style* proper, in which the peculiar characteristics of the style are exhibited. To this latter period belong some of the finest monuments of British architecture.

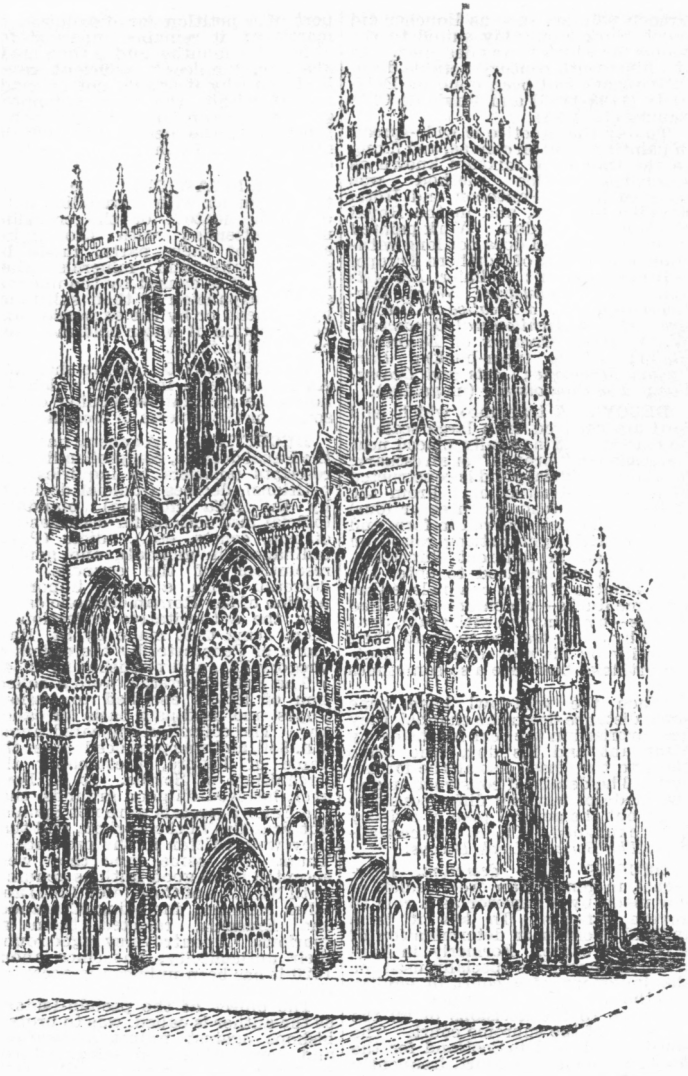
DECORATIVE ART. May be divided into (1) mural decoration by painting, mosaic, or similar means; (2) the application of ornament to products of another art or craft, e.g. furniture, textiles, porcelain, metal-work. Of these the second comes first historically. The most primitive races decorate their weapons and household utensils. Sometimes a natural peculiarity of the material is accentuated or developed; sometimes a totemic sign or representation of a god is carved or painted on an article to act as a charm.

In both cases the tendency is for a formal pattern to be evolved. This may develop into a style of ornament distinctive of different races and periods, varying with the religious beliefs and the natural features of the country concerned. For example, in Egypt, the lotus, the papyrus, and the symbols of the Egyptian deities play a great part in decoration; while Greek ornament is distinguished by the use of the conventionalized honeysuckle and acanthus flower, of formal architectural motives such as the Greek "Key," and the skilful use of the human figure, especially on vases. Chinese and Japanese decoration mainly uses flowers, natural scenery (especially water), mythological and other animals, and the human figure. Mohammedan decorative art stands apart in being based entirely on geometrical or formalized floral forms, owing to representations of the human figure being forbidden by the *Koran*. In modern times, decoration consists mainly of variations and elaborations of motives already exploited, the art of classical antiquity, Egypt and the Far East, being dominant influences at different times. To-day the influence of savage art is making itself felt.

Mural Decoration.—The art of mural decoration is of great antiquity. There are in existence paintings from Knossos in Crete, dating from the eighteenth century B.C., probably carried out in some distemper method. True fresco, in which carbonate of lime is formed and encloses the colours applied to the wall while wet, was probably not used until much later. Wall paintings were common in Egyptian houses and tombs, and have been found in Etruscan tombs; and those of the Greeks and Romans are famous. The decorations of Pompeii probably include many Greek originals, as well as Roman work. The use of mosaic was developed on a magnificent scale under the Byzantine Empire, and in Italy during the eleventh and twelfth centuries.

In Italy, after the eleventh century, wall decoration in fresco becomes of supreme importance. The paintings of Giotto (1276-1336) at Florence, Assisi, and Padua are among the earliest of a great series culminating in the decoration of the Sistine Chapel by Michael Angelo (1475-1564). In Venice, where wall decoration developed later than elsewhere in Italy, it generally took the form of oil-paintings on canvas, which was afterwards fixed to the wall or ceiling. Carpaccio (1490-1522), Titian (1477-1576), Tintoretto (1518-94) carried this art to unsurpassed heights.

For a time mural painting was neglected in favour of easel pictures; but during the eighteenth century G. B. Tiepolo (1696-1769) well maintained the Venetian tradition, and



DECORATED STYLE, YORK CATHEDRAL, WEST FRONT

French painters such as Boucher did much work admirably suited to the rooms for which it was designed. In the nineteenth century notable decorative work had been done by Delacroix (1798-1863) and Puvis de Chavannes (1824-98).

To-day the practice is wide-spread of painting in oil on canvas, and fixing to the wall by a mixture known as *marouflage*. This method was adopted in the Pantheon and Hôtel de Ville in Paris, and in the Royal Exchange in London. Work painted direct on the wall does not long withstand the climate of Northern Europe. —BIBLIOGRAPHY: Molinier, *Les Arts appliqués à l'industrie*; Ward, *Historic Ornament: a Treatise on Decorative Art and Architectural Ornament*; W. A. Dyer, *Creators of Decorative Styles*; *Studio* (year-book); *Burlington Magazine*; *Arts and Decoration*; *The Connoisseur* (magazine).

DECOY'. A trap into which wild fowl are decoyed on a large scale to be caught. It is usually placed near the seashore, "broads," or an estuary; or a large artificial pond is constructed in a secluded situation. From the water several (usually three or four) pipes or channels, curved in form and covered with light netting raised on hoops, lead in different directions. The birds are induced to enter the wide mouths of these channels, either by tame ducks—which are also called decoys—by being fed with grain, or at times by a dog trained to excite their curiosity by his movements. Floating artificial birds are also sometimes used.

When the wild-fowl have gone some distance down the channel, they are surprised in the rear by the decoy attendant and his dog, who drive them to the closed net at the farther end. The details of construction and the mode of working differ considerably, but the general plan of a decoy is as explained. Cf. R. Payne-Gallwey, *The Book of Duck Decoys*.

DECREE' (Lat. *decretum*, judgment), in general, an order, edict, or law made by a superior as a rule to govern inferiors. In law it is a judicial decision or determination of a litigated cause. Formerly, in England, the term was specially used for the judgment of a court of equity, but the word *judgment* is now used in reference to the decisions of all the divisions of the supreme court. The word is still used in Scotland for the final judgment of a court, frequently in the form *decreet*.

DECREE NISI. Literally, a "decree unless," in England, is the decree of divorce issued by the court on satisfactory proof being given in support of a petition for dissolution o marriage; it remains imperfect fo at least six months, and is then mad absolute, "unless" sufficient caus is shown why it should not be mad so. If within the time appointe good reason can be shown for such proceeding, the decree nisi will b reversed, or a further inquiry will b ordered.

DECREPITA'TION. The act o flying asunder with a crackling noise on being heated, or the crackling noise, attended with the flying asunder of their parts, made by several salts and minerals when heated. It is caused by the unequal sudden expansion of their substance by the heat, or by the expansion and volatilization of water held mechanically within them.

DECRESCENDO (dā-kre-shen'dō). An Italian term in music which denotes the gradual weakening of the sound, or the reverse of *crescendo*.

DECRE'TALS. A general name for the Papal decrees, comprehending the rescripts (answers to inquiries and petitions), decrees (judicial decisions by the *Rota Romana*), mandates (official instructions for ecclesiastical officers, courts, etc.), edicts (Papal ordinances in general), and general resolutions of the councils. The decretals form a most important portion of the Roman Catholic canon law, the authoritative collection of them being that made by St. Raymond of Penaforte, by the orders of Gregory IX., and published in 1234.

The False Decretals were a collection of letters ascribed to various Popes, and used as a basis for canon law. The collection appeared about A.D. 850, and was produced under the name of Isidore, presumably the Archbishop of Seville. It is, however, believed on good grounds, that the False Decretals were not Spanish but Frankish in their origin, and that they were written in the province of Tours. For some time they were accepted in all good faith as genuine, until Nicholas of Cusa (died 1464) and other scholars, including Cassander and Erasmus, rejected them as spurious. A controversy raged round their authenticity, but since about 1620 it has been universally accepted that they are forgeries.

The object of the pseudo-Isidore, as the author is called, was to protect bishops against unjust accusations and deprivations, to safeguard the property and persons of all clergy against temporal rulers, and to increase the ultramontane authority of the Pope. The author propagated the belief that, ever since the age of the Apostles, the Bishops of Rome

had been declaring law for the universal Church in decretal letters. Canon law was founded on this belief, which was, therefore, of the utmost importance.

DÉDÉAGATSH. A seaport town of Greece, on the Ægean Sea, connected by rail with Constantinople, Burgas, and Salonica. The town, which belonged to Turkey for over four centuries, was ceded to Bulgaria in 1913, after the Balkan War. In 1920, however, it was ceded to Greece.

DEDICA'TION. The act of consecrating something to a divine being, or to a sacred use, often with religious solemnities. (*See* FEAST OF DEDICATION.) Also an address prefixed to a book, and formerly inscribed to a patron, testifying respect and recommending the work to his protection and favour; now chiefly addressed to friends of the author, or to public characters, simply as a mark of affection or esteem.

DEDUCTION. In mathematics, the act of subtraction. Accountants deduct losses from gross receipts; agents deduct commissions before making payments.

In logic deduction is the act of deducting from general principles particular results. Deductive reasoning is followed in making weather forecasts. Thus, if for many years it has been wet on the 40 days following St. Swithin's day, it can be deducted that it will be wet during that period in the future. The opposite, though similar process, from the particular to the general, is induction.

DEE, John. English mathematician, alchemist, and astrologer, born 1527, died 1608. In early life he successfully devoted much of his time to mathematical, astronomical, and chemical studies. In the reign of Mary he was imprisoned on suspicion of practising the "black art"; but was in favour with Elizabeth, who is said to have employed him on secret political missions, and paid him a fixed salary. In 1581, along with a man named Kelly, he visited several of the continental courts, pretending to raise spirits. In 1595 he obtained from the queen the wardenship of Manchester College. Here he resided for nine years, and then returned to his old residence at Mortlake, where he died, leaving behind him many works, partly of a scientific character, partly dealing with the occult sciences and invocation of spirits. His *speculum* or mirror is preserved in the British Museum.

DEE. The name of several British rivers. (1) A river of Scotland, partly in Kincardineshire, but chiefly in Aberdeenshire, one of the most finely wooded and one of the best salmon rivers in Britain. It rises on the S.W. border of Aberdeenshire, and flows generally eastward 87 miles to the North Sea, having Aberdeen at its mouth.

(2) A river in N. Wales and Cheshire; rises in Lake Bala, Merionethshire; flows N.E., N., and N.W. to the Irish Sea, 20 miles below Chester; length about 80 miles.

(3) A river of Scotland, county of Kirkcudbright, rises in Loch Dee, a lonely loch, 7 furlongs long and from 1½ to 4 furlongs wide, situated among the western hills. It flows S.E. and S., and falls into Kirkcudbright Bay; length, 38 miles.

DEED. In law, a writing under seal which in English law imports consideration to support a promise. In former days, when writing was hardly a mark of good birth, the affixing of the great man's seal in the presence of witnesses was too solemn a matter to be thought of as done without consideration. And so the doctrine arose, which remains to this day, though now the seal itself may be any sort of mark or impression of the slightest kind, if the document bear upon it the signed attestation by witnesses of its due execution by the sealing and delivery of the party. (*See* DELIVERY.) All deeds must also now be signed (Law of Property Act, 1925).

DEEG. A town and fortress in Bhurtpore, Central India, 57 miles north-west of Agra, situated in the midst of marshes, and almost surrounded by water during a great part of the year. At the south-west corner is a lofty rock, on which the citadel stands. It was taken in 1804 by General Fraser, and dismantled after the capture of Bhartpur by Lord Combermere. Pop. 15,828.

DEEM'STER, DOOMSTER, or DEMPSTER. An officer formerly attached to the High Court of Justiciary in Scotland, who formally pronounced the doom or sentence of death on condemned criminals. The office was conjoined with that of executioner. A graphic description of the office of deemster is given in Scott's tale *Old Mortality*. The name is now given in the Isle of Man to two judges who act as the chief justices of the island, the one presiding over the northern, the other over the southern division.

DEEPING, George Warwick. English novelist. Born at Southend-on Sea, in 1877, he was educated at the Merchant Taylors School, London.

and at Trinity College, Cambridge. He took a medical degree in 1902 and practised for a short time. In 1903 he published a novel, and henceforward, except during the Great War, when he saw active service with the R.A.M.C., he devoted his time to writing, his reputation rising steadily with each work. They include, *Bertrand of Brittany*, 1908; *Martin Valiant*, 1917; *The Prophetic Marriage*, 1920; *Sorrell and Son*, 1925; *Old Pybus*, 1928; *Roper's Row*, 1929; and *The Exiles*, 1930; *The Road*, 1931; and *New Wine and Old*, 1932.

DEEP-SEA EXPLORATION. In contrast to researches in coastal waters, begun towards the end of the eighteenth century. Captain J. C. Phipps took soundings in Arctic seas in 1773, and B. de Saussure determined deep temperatures in the Mediterranean in 1780. A few attempts at deep-sea research were made in Arctic regions by W. Scoresby in 1811, and Sir J. Ross in 1817-78, in Antarctic seas by Sir J. Clark Ross in 1839-43, and in the North Atlantic by the United States navy from 1844 onwards.

Systematic exploration of the ocean depths dates from 1851, when U.S.S. *Dolphin* began the survey of a route for a transatlantic cable. In 1854 the American hydrographer M. F. Maury published the first bathymetrical chart of the North Atlantic. In 1857 H.M.S. *Cyclops* took a line of soundings for cable purposes from Ireland to Newfoundland along the great circle route, and during the next few years work in that ocean proceeded rapidly. Especially notable was the work of M'Clintock in H.M.S. *Bulldog* (1860), Wyville Thomson and W. B. Carpenter in H.M.S. *Lightning* (1868), and Gwyn Jeffreys in H.M.S. *Porcupine* (1869).

From 1872-76 H.M.S. *Challenger*, with G. Nares as captain and Wyville Thomson as scientific leader, in a world-circling cruise traversed all the great oceans in many directions. With this expedition were associated J. Murray and J. Y. Buchanan, the former of whom was subsequently editor of the results which, published by the British Goverr ment in fifty large volumes, laid the foundations of the science of oceanography. The U.S.S. *Tuscarora* in the Pacific, the German steamer *Gazelle* in a circumnavigating cruise, and the Norwegian steamer *Vöringen* in the North Atlantic, did valuable work about the same period.

At a later date A. Agassiz, in the U.S.S. *Blake* and *Albatross*, made researches chiefly in the Caribbean Sea and Gulf of Mexico, while H.M *Lightning*, *Porcupine*, *Knight Err* and *Triton* explored the waters of Faroe-Icelandic ridge. From 1 to 1883 the French vessels *Travail* and *Talisman* explored the Bay Biscay, and in 1885 the Prince Monaco began a long series of ocea graphical researches in the Medi ranean, North Atlantic, and Bare Seas in his yachts *Hirondelle* a *Princesse Alice*. By the use of proved apparatus the Prince Monaco raised the standard of search, and by the foundation of oceanographical museum at Mona and an oceanographical institute Paris, gave a great stimulus to science.

F. Nansen in the *Fram* (1893-96) w the first to explore the depths of t Arctic Ocean. In 1895-96 the Dani steamer *Ingolf* was at work in t North Atlantic, in 1898-99 the Germ steamer *Valdivia* explored the dept of the South Atlantic, and in 18 the U.S.S. *Nero* explored unknov parts of the Pacific. Research were undertaken in tropical Paci waters in 1899-1900 and in 1904 A. Agassiz in the *Albatross*, in Mal yan waters by the Dutch steam *Siboga* in 1899-1900, and in the Nor Atlantic by J. Murray and J. Hjort the Norwegian steamer *Michael Sa* in 1910.

Knowledge of the deep Antarct waters is due chiefly to A. de Gerlach in the *Belgica* (1898-99) in the Belling hausen Sea, W. S. Bruce in the *Scoti* (1902-4) and O. Nordenskjöld in th *Antarctic* (1901-3) in the Weddell Se and J. K. Davis in the *Aurora* (1911 14) between Australia and Antarctic

In recent years much oceano graphical work has been done, thoug an attempt to organize a new Britis expedition on the scale of the *Chal lenger* was abandoned on the ground of expense. The German *Meteor* under Dr. A. Merz and Capt. F. Spies in 1925-27, explored the South Atlan tic and added materially to know ledge. In the same waters, and particularly those of the Scotia Sea the R.R.S. *Discovery II.* has done detailed mapping and established the South Sandwich Deep, between 1926 and 1933. The *Carnegie* of the U.S. Department of Terrestrial Magnetism, under Capt. J. P. Ault, did much work in the Pacific in 1928-29 until destroyed by fire at Samoa in November 1929. The Danish *Dana*, under Prof. J. Schmidt, worked in the tropical waters of the Atlantic, Pacific, and Indian Oceans, 1928-30, and the Dutch *Willebrord Snellius* (Commander P. M. van Riel) exhaustively examined the waters of the Dutch East Indies from 1929 onwards. The

British survey vessel *Challenger*, after working around Bear Island, undertook survey in Labrador waters in 1933.

Apparatus.—The apparatus employed in deep-sea research has undergone great improvements during the last thirty or forty years, with the result that the observations, necessarily the result of indirect methods, have now attained so fine a degree of accuracy that much of the earlier work requires to be revised. Hemp rope, ½ inch in diameter, used in the early days of sounding, was replaced either by a single strand of piano-wire 1 mm. in diameter, or a triple stranded wire 2 to 4 mm. in diameter. This resulted in less friction, a more perpendicular line, and greater speed of work. A seven-strand line was generally used when instruments were suspended on the wire.

The Lucas sounding-machine, which is generally employed for deep-sea work, is furnished with a spring brake that stops the reel when the tension of the wire is relaxed on the sounding-tube or sinker touching the bottom. A hollow sounding-tube is generally attached by a fathom of rope to the end of the sounding-line. Cast-iron sinkers weighing about 50 lb. are slung on the tube, and by a simple mechanism automatically detached as soon as the tension is relaxed. The hollow end of the tube buries itself in the deposits on the sea-floor. By an arrangement of valves this sample is retained in the tube, and brought to the surface as the wire is wound in. The sinker-weights are left on the ocean-floor. This method of sounding tends now to be displaced by *sonic* or *echo* sounding. When the speed of sound in water is known the depths of the ocean can be found by measuring the time intervals between an explosion on the surface and the return of the echo from the floor of the sea. Satisfactory apparatus involving this principle is now largely in use and has resulted in much more detailed knowledge of submarine configuration than the older methods allowed.

Apparatus has been devised for taking water samples for analyses, and for recording temperatures at any depth. The Monagasque reversing-deck water-bottles are brass cylinders, which remain open until the ascent begins, when the upward motion reverses a propeller and inverts and closes the bottle. The shock of reversing, by causing a fine thread of mercury to break at a constriction in the tube of the attached thermometer, registers the temperature. These thermometers are made to withstand a pressure of several tons to the square inch.

The Nansen-Pettersson bottle, which is used mainly at comparatively small depths, is closed by a metallic "messenger" sent down the wire. The bulb of a thermometer is enclosed in the imprisoned water sample, which is protected by insulated walls from changes of temperature during the rapid ascent.

Reversing apparatus has been devised, also, for securing the exposure of sterilized tubes in order to test the bacterial content of the water.

The biological exploration of the sea is conducted by trawls and dredges towed by steel ropes, and by various forms of net. The finest nets for catching micro-organisms are made of miller's silk gauze, which has about 6000 meshes to the square centimetre. So far no apparatus has been devised for securing samples of the solid rock *in situ* below the accumulated deposits on the sea-floor.

While the main features of the ocean basins have now been mapped, there are still blank areas in the Southern and Arctic Oceans, and in all waters much detailed work is required. The greatest depths recorded are 5269 fathoms near the Island of Guam in the Pacific, and 5348 fathoms in the Swire deep in the South Pacific. Depths over 3000 fathoms are termed deeps, and are given distinctive names. Of the 57 known deeps, 32 are in the Pacific, 5 in the Indian, 19 in the Atlantic, and 1 in the Southern Ocean. Sir J. Murray calculated that the percentages of the total area of the ocean-floor (139,686,000 sq. miles) between consecutive contour-lines are as follows: 0 to 1000 fathoms, 15·6; 1000 to 2000 fathoms, 19·3; 2000 to 3000 fathoms, 58·4; 3000 to 4000 fathoms, 6·5; below 4000 fathoms, ·15.

Deep-sea Deposits.—Deep-sea deposits, the study of which was based on the *Challenger* collections, have been found to be of various origins: (*a*) calcareous and siliceous tests of floating organisms; (*b*) calcareous matter from corals, bones, teeth, shells, etc.; (*c*) debris of the land and submarine rocks; (*d*) substances synthesized on the sea-floor; (*e*) extra-terrestrial matter.

Physical researches have done much to explain the main lines of oceanic circulation, and have shown that temperature in open oceans shows little seasonal variation below 100 fathoms. In deeper waters the temperature decreases gradually to the bottom, where a temperature between 30° and 35° F. is found throughout the oceans. The warm waters of

tropical oceans extend only to a small depth, and it is estimated that over 80 per cent. of ocean waters have a temperature below 40° F. Since light penetrates less than 100 fathoms below the surface, there is complete darkness at greater depths.

Life exists at all depths in the ocean. Plankton is the name given to floating animals and plants, and free-moving animals, at all depths. Organisms on the ocean-floor are grouped into certain life zones, littoral, continental shelf, and deep sea or abyssal. Each group shows adaptations to its specialized environment.

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DEER. A general name for the ungulate or hoofed ruminating animals constituting the family Cervidæ, of which the typical genus is Cervus, the stag or red-deer. The distinguishing characteristics of the genus are that the members of it have solid branching antlers which they shed every year, and eight cutting-teeth in the lower jaw and none in the upper. The antlers are bony out-

Red-deer

Fallow-deer

growths from the frontal region of t skull, and are always present in t male, except in musk-deer (Moschu and water-deer (Hydropotes). reindeer they are possessed by bo sexes.

The forms of the horns are variou sometimes they spread into bro palms which send out sharp sna around their outer edges; sometim they divide fantastically in branches, some of which project ov the forehead, whilst others are reare upwards in the air; or they may b so reclined backwards that the anim seems almost forced to carry its hea in a stiff erect posture. They ar used as defensive and offensiv weapons, and grow with grea rapidity.

There are many species of deer, a the red-deer or stag, the fallow-dee the roebuck, the reindeer, the moos the elk, the axis, rusa, muntjac wapiti, etc. Deer are pretty widel distributed over the world, thoug there are none in Australia or i Africa. In the latter the antelope (whose horns are permanent) tak their place. The reindeer alone ha been domesticated.—Cf. R. Lydekker, *The Deer of all Lands*.

DEER, Old. A village and parish of Scotland, in the Buchan district of Aberdeenshire, now of little importance, but interesting as an early seat of Christianity, a religious house having been established here by St. Columba of Iona about 580, which was endowed with lands by Malcolm II. in 1010, and refounded by Comyn, Earl of Buchan, about 1218-9. Hardly anything of the buildings now remains, bu. there is a manuscript still in existence called the *Book of Deer*, which had belonged to the monastery, and which contains the earliest specimens of Scottish Gaelic known. The MS. itself is in Latin, and contains St. John's Gospel and parts of the others, etc., the Gaelic

being entries, of little importance in themselves, written in blank portions of the book. They are ascribed to the twelfth century—if not even older.

DEER FOREST. An extensive tract of mountainous land set apart for the protection of wild deer, especially red-deer, which are used for purposes of sport. In Scotland, to which such forests are chiefly confined, some 3,500,000 acres, distributed over nine or ten counties, are devoted to deer forests, numbering about 150, the largest being Mar (87,000 acres), Blackmount (80,000 acres), and Strathconan (59,000 acres). The land is usually in by far the greater part of the wildest and least productive kind, but of course may yield large numbers of grouse and other game as well as deer.

A great many of the forests are rented by sportsmen from the proprietors, and the rents drawn are considerable, ranging from £1000 to £5000, and even much more, per annum for a single forest. Crofters have often been removed from their holdings in order that the land might be incorporated in some deer forest, and this has been regarded as a great grievance. On the other hand, the lessees of the forests have expended large sums of money in the country, and the rents paid the proprietors have enabled them to do the same.

DEERHOUND. Breed of dog. A rough-haired, stoutly-built variety, of Scottish greyhound, it is used especially in deerstalking. Brindled, fawn, or blue, it has long tapering head and stern, and well-arched loins. Quick-running, and keen-scented, it averages 90 lbs. in weight. The almost extinct Irish deerhound has reappeared by careful breeding.

DEER-MOUSE. The common name of the animals belonging to the genus Jaculus (Meriônes), an American genus of rodent animals allied to the jerboas of the Old World. The deer-mouse of Canada (*J. hudsonius*) is a pretty little animal of the size of a mouse, with very long hind-legs and tall, and very short fore-legs.

DEER-STALKING. An exciting but laborious mode of hunting the red-deer, in which, on account of the extreme shyness of the game, their far-sightedness and keen sense of smell, they have to be approached by cautious manœuvring before a chance of obtaining a shot occurs. Great patience and tact and a thorough knowledge of the ground are essential to a good stalker, who has to undergo many discomforts in crouching, creeping, and wading through bogs.

Advance from higher to lower ground is usually made, since the deer are always apt to look to the low ground as the source of danger. "Deer-driving" towards a point where the shooters are concealed is often practised, but is looked on as poor sport by the true deer-stalker.

DEFAMA'TION. The malicious uttering of slanderous words respecting another which tend to destroy or impair his good name, character, or occupation. To constitute defamation in law the words must be spoken maliciously. Defamation is actionable either at common law or by statute.

DEFAULT'. In law, signifies generally any neglect or omission to do something which ought to be done. Its special application is to the non-appearance of a defendant in court when duly summoned on an appointed day. If he fail to appear, judgment may be demanded and given against him by default.

DEFEASANCE (Fr. *défaire*, to defeat or undo). In English law, a deed collateral to and executed at the same time as another or principal deed, and embodying certain conditions on the occurrence of which the operation of the principal deed is annulled or "defeated." Such a condition, if contained in the principal deed itself, is known as a "defeasance clause." In Scots law, a legacy which vests in a person subject to his being divested on the occurrence of an uncertain event is said to vest "subject to defeasance."

DEFENCE. A statement of fact which a defendant makes in answer to plaintiff's claim. It must not be argumentative, irrelevant, or evasive, and must specifically or by necessary implication deny or admit with or without explanations, or (if the facts alleged are not within defendant's knowledge) decline to admit, plaintiff's averments. A preliminary or dilatory defence, if sustained, generally involves dismissal of the action, but does not prevent a new action being raised. A peremptory defence is a defence on the merits, and if upheld causes finality between the parties on the points at issue.

DEFENCE OF THE REALM ACTS ("Dora"). A term under which all the statutes and regulations enacted in 1914 to meet the emergencies of the European War are known. The Defence of the Realm Consolidation Act was passed on 27th Nov., 1914, and two amending Acts became law on 16th March, 1915. They empowered His Majesty in Council to make all regulations found necessary

for the security and safety not only of the army and navy, but the realm in general.

The Defence of the Realm Acts were made known to the public by proclamation, and had the force of parliamentary laws, disobedience entailing punishments of all degrees of severity, from a small fine to the death penalty. A vast number of regulations were issued during the European War under these Acts, which were called by the public "Dora." They dealt with all sorts of cases, from trading with and giving information to the enemy, traffic in arms, and espionage, to lighting rules.

DEFEN'DANT. In law, the party against whom a complaint, demand, or charge is brought; one who is summoned into court, and defends, denies, or opposes the demand or charge, and maintains his own right. The term is applied even if the party admits the claim.

DEFENDER OF THE FAITH (*Fidei Defensor*). A title belonging to the King of England, as *Catholicus* to the King of Spain, or as *Christianissimus* did to the King of France. Leo X. bestowed the title of *Defender of the Faith* on Henry VIII. in 1521, on account of his book against Luther, and the title, confirmed to Henry by Parliament in 1544, has been used by the sovereigns of Great Britain ever since.

DEFFAND (def-ăn), **Marie de Vichy Chamrond, Marquise du.** A conspicuous character among the French literati of the eighteenth century, born 1697, died 1780. In 1718 she married the Marquis du Deffand, from whom she separated after ten years. During the latter part of her long life she became the centre of a literary coterie, which included Choiseul, Boufflers, Montesquieu, Voltaire, D'Alembert, David Hume, and Horace Walpole.

She possessed much natural talent; but the laxity of her morals formed a strong contrast to the superiority of her intellectual powers. Among her clever sayings the following may be quoted: "I was bored, which accounts for all my follies." Her correspondence has been several times republished.—Cf. Sainte-Beuve, *Causeries du Lundi* (vols. i. and xiv.).

DEFILE. A portion of the route which troops can only traverse on a narrow front, e.g. a mountain pass, a bridge, or an embankment.

DEFINITION (Lat. *definire*, to set limits to). A brief and precise description of a thing by its properties; an explanation of the signification of a word or term, or of what a word is understood to express. Logicians distinguish definitions into *nominal* and *real*. A nominal definition explains the meaning of a term by some equivalent word or expression supposed to be better known.

A real definition is again *accidental*, or a description of the accidents, as causes, properties, effects, etc.; or *essential*, which explains the constituent parts of the essence or nature of the thing.

An essential definition is, moreover, *metaphysical* or *logical*, de fining "by the genus and difference," as it is called; as, for example, "a plant is an organized being, destitute of sensation" where the former part of the definition states the genus (organized being) and the latter the difference (destitute of sensation); or *physical*, when it distinguishes the physical parts of the essence; thus, a plant is distinguished by the leaves, stalk, root, etc.

A strictly accurate definition can be given of only a few objects. The most simple things are the least capable of definition, from the difficulty of finding terms more simple and intelligible than the one to be defined. The doctrine of definition, which began in the controversies between Plato and Antisthenes, received its complete formulation in Aristotle.

DEFLATION. Removal of the contents of a gas bag, thus reducing its volume. By analogy it denotes a reduction in the amount of paper money in circulation. From 1914 to 1920 the volume of paper money increased enormously, especially in France and Germany, causing a great rise in prices. To check this the amount of paper money was gradually reduced, bringing prices down, and this was known as deflation. *See* REFLATION.

DEFOE (dē-fō), **Daniel.** English author, was born in 1659 in London, where his father, James Foe, carried on the trade of a butcher, died in London in 1731. In 1685 he joined the insurrection of the Duke of Monmouth, and had the good fortune to escape; after which he made several unsuccessful attempts at business, and at last turned his attention to literature. In 1701 appeared his satire in verse, *The True-born Englishman*, in favour of William III. As a zealous Whig and Dissenter he was frequently in trouble.

For publishing *The Shortest Way with the Dissenters* (1702), the drift of which was misunderstood by both Churchmen and Dissenters, he was pilloried and imprisoned in Newgate, obtaining his liberty through the in-

fluence of Harley, who employed him in several important missions, particularly in the negotiations for the union with Scotland, of which he wrote the history.

While in Newgate, in 1704, he commenced *The Review*, a literary and political periodical which lasted for nine years. In 1705 he wrote a short account of the *Apparition of Mrs. Veal*, a fictitious narrative accompanying a translation of Drelincourt, *On Death*. In 1706 he published his longest poem, entitled *Jure Divino*, a satire on the doctrine of divine right. In 1707 he was in Scotland, which he also visited several times subsequently in connection with political affairs, and as agent of those in power.

Daniel Defoe

In 1719 appeared the most popular of all his works, *The Life and Surprising Adventures of Robinson Crusoe*, the favourable reception of which was immediate and universal. The success of Defoe in this work of fiction induced him to write a number of other lives and adventures in character; as *Moll Flanders*, *Captain Singleton*, *Roxana*, *Duncan Campbell*, *The Memoirs of a Cavalier*, and *Journal of the Plague Year*.

After the accession of George I. he was employed by the Government in some underhand work connected with the Jacobite press, and was a prolific contributor to periodical and ephemeral literature.—BIBLIOGRAPHY: William Minto, *Daniel Defoe* (English Men of Letters Series); Thomas Wright, *Life of Daniel Defoe*.

DEFORCEMENT. In law, the holding of lands or tenements to which another person has a right; a general term including any species of wrong by which he who has a right to the freehold is kept out of possession. In Scots law, it is the resisting of an officer in the execution of law.

DEFORMITIES. May be congenital or acquired. Among the former category may be included such conditions as webbed fingers or toes, supernumerary fingers or toes, and other gross peculiarities of structure that may be hereditarily transmitted to children from their forebears. But most deformities are acquired by the individual at some period during his life, either before or after birth. For example, such conditions as rickets, involving deformities of the limbs, body, and head, may be brought about by errors of diet in childhood. Destruction of the thyroid gland early in life produces a stunting of growth, a misshapen body and mentally a state of idiocy.

Factors that interfere with the growth and development of the child in the womb can produce a whole series of different deformities, the nature of which seems to be determined by the period when the injury is inflicted. Any hindrance to growth at a very early stage of the embryo may cause gross forms of monstrosity, such as destruction of the brain and spinal cord, development of two heads on one trunk, reduplication of the limbs or even of the whole body. Similar interference with growth later on may cause less drastic changes in structure; such as hare-lip, cleft palate, club-foot, and a large series of other modifications, from which scarcely any part of the body is exempt.

In addition to these various forms of malformation due to the interruption of the normal process of development, other deformities may arise from the appearance in man of structures that normally developed in man's ancestors, but are usually absent in man himself. Examples of such atavisms are found in the development of a hairy coat, of supernumerary nipples, and occasionally of a rudimentary tail.

One of the most distinctive types of deformity is known as *achondroplasia*. It is a condition of dwarfing, the limbs especially being disproportionately shortened, associated with certain very characteristic changes in the face and skull, due to an interference with the development of the cartilages from which certain of the bones of the skeleton are formed.

Another peculiar deformity, known as *acromegaly*, is due to interference

with a remarkable little gland (pituitary) found at the base of the brain. It expresses itself as a great but unequal growth of the skeleton, the lower jaw, the face, the hands, and feet being disproportionately enlarged. Most of the so-called giants seen in travelling shows are the victims of this disease.

Apart from these extreme cases, injury or disease may give rise to local deformity. Perhaps the most striking example of this class is the condition of hunch-back, due to the collapse and bending of the spinal column as the result of tubercular disease of the bone. Minor forms of spinal curvature may occur as the result of illness or of careless deportment. So-called rheumatoid arthritis, or "rheumatic gout," may cause profound changes in any joint, and often gives rise to pronounced deformities.

In no branch of surgery has greater success been achieved than in remedying deformities; but this department (*orthopædic surgery*) needs special skill and experience.

DEGAS, Hilaire Germain Edgard. French painter, born in Paris 19th July, 1834, died there 27th Sept., 1917. He was educated at the École des Beaux Arts, and became known as one of the foremost French genre painters. Degas has been classed as an Impressionist, but he was in reality an independent, and a realist. Among his best-known works are: *Race Horses*, *Ballet Girls*, and *Les Blanchisseuses*. In 1912 the sum of 435,000 francs was paid for his *Danseuses à la barre*, and 82,000 francs for his *Modistes*.

DEGENERATION. In biology, simplification of structure, in adaptation to modes of life where complexity is less necessary. It is exemplified by numerous parasitic plants, such as the dodder (Cuscuta), which feeds by absorbing the juices of clover and other forms. Here the roots have disappeared, the leaves are reduced to minute scales, and there is an entire absence of the green colouring matter (chlorophyll) essential to non-parasitic plants.

There are still more striking cases among animals. Tapeworms, for instance, live in the intestines of various vertebrates, and feed by absorbing the digesting food that surrounds them. They are entirely devoid of an alimentary canal, while the nervous system and sense organs are but feebly developed.

Striking degeneration may be associated with the fixed or sedentary mode of life, as in the sea-squirts or ascidians, lowly members of the vertebrate sub-kingdom. These are commonly hatched from the egg as active tadpole-like larvæ, with a well-developed nervous system, and a muscular tail supported by an elastic rod (urochord), which may be regarded as a rudimentary backbone. The larva ultimately attaches itself to some firm object, its tail becomes absorbed, and its nervous system is greatly simplified.

DE GÉRANDO (dė zhā-ràn-dō), **Joseph Marie, Baron.** A French philosopher and statesman, born in Lyons 1772, died 1842. After serving in the army for some time, he took office as Minister of the Interior under Lucien Bonaparte, and was afterwards engaged in the organization of Tuscany and the Papal States on their union with France. In 1819 he commenced a course of lectures on the Faculté de Droit, in Paris, on public and administrative law. He was raised to the peerage in 1837. De Gérando acquired great fame by his philosophical writings.

His principal works are: *Des Signes et de l'Art de Penser*, *De la Génération des Connaissances Humaines*, *Histoire comparée des Systèmes de Philosophie*, *Du Perfectionnement Moral et de l'Education de Soi-même*, *De l'Education des Sourds-muets de Naissance*, and *De la Bienfaisance Publique*.

DEGRADATION. The ecclesiastical censure by which a clergyman is divested of his holy orders. The canon law distinguishes degradation into two sorts: the one summary, by word only; the other solemn, by stripping the person degraded of those ornaments and rights which are the ensigns of his order or degree. Thus from a priest were taken paten, chalice, and chasuble; from a deacon, New Testament and stole; from a sub-deacon, alb and maniple; from an acolyte, taper and urceole; and from ostiarii, keys and surplice.—The term is also applied to the deprivation of offices not ecclesiastical.

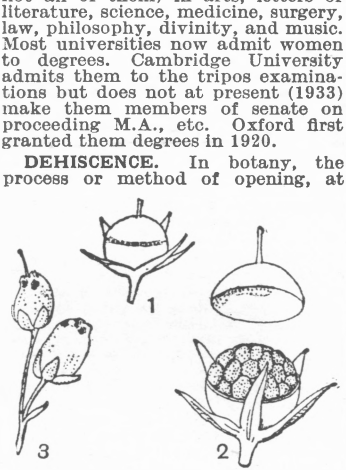
DEGREE. In geometry or trigonometry, the chief practical unit used in the measurement of angles. A degree is the 90th part of a right angle, or the 360th part of a complete turn. In other words, a right angle contains 90 degrees, or, as it is usually written, 90°. The degree is divided into 60 minutes, and the minute into 60 seconds. An angle of 45 degrees 12 minutes 20 seconds is written 45° 12′ 20″. The unit angle used in theoretical work is the *radian*. The relation between this and the degree is given by the equation π radians = 180°, where π is the ratio of the circumference of a circle to its

diameter, the approximate value of which is 3·14159.

In the phrases *degree of latitude*, *degree of longitude*, the word degree frequently denotes a length measured on the earth's surface, that length corresponding to an angle of 1° defined in a certain way (*see* LATITUDE; LONGITUDE). For *degree* in the measurement of temperature, *see* HEAT.

DEGREE. In universities, a mark of distinction conferred on students, members, or distinguished strangers, as a testimony of their proficiency in the arts or sciences, or as a mark of respect, the former known as full, the latter as honorary degrees. The degrees are bachelor, master, and doctor, and are conferred (though not all of them) in arts, letters or literature, science, medicine, surgery, law, philosophy, divinity, and music. Most universities now admit women to degrees. Cambridge University admits them to the tripos examinations but does not at present (1933) make them members of senate on proceeding M.A., etc. Oxford first granted them degrees in 1920.

DEHISCENCE. In botany, the process or method of opening, at



1, Fruit of Scarlet Pimpernel before dehiscence. 2, After dehiscence. 3, Fruit of Snapdragon, showing the three pores by which seeds escape.

ripeness, of fruits, anthers, or sporangia.

DEHRA (dā'ra). A town of India, capital of Dehra Dun, beautifully situated, with military cantonments, English, Presbyterian, and Roman Catholic churches, and an American mission. Pop. 47,273.

DEHRA DUN (dā-ra dön), or **DEHRA DOON.** A beautiful and fertile valley in the Meerut division of the United Provinces, India, at the south-west base of the lowest and outermost ridge of the Himalayas. It is bounded on the north by the Jumna; north-east by the mountains of Garwhal, from 7000 to 8000 feet high; south-east by the Ganges; south-west by the Sewalik range, 3000 to 3500 feet high. Its length from south-east to north-west is about 45 miles; breadth, from 15 to 20 miles. Area, 1193 sq. miles; pop. about 215,000.

DEYHDRATION. The process of depriving a substance of water: e.g. alcohol may be *dehydrated* by heating it in contact with quicklime, and many crystalline salts may be dehydrated by heat alone, or merely by placing in a desiccator.

DEI GRATIA (" by the grace of God "). A formula which sovereigns add to their title. The expression, taken from several apostolical expressions in the New Testament, was first used by the bishops at the Council of Ephesus (A.D. 431). It was used only by the clergy until the fifteenth century, and assumed by kings in the sixteenth, although some maintain that temporal princes used this formula as early as the eighth century.

DEIOCES (dēi'okēz). Flourished about seven centuries B.C.; rose from a private station to be the founder of the Median Empire. By acting as arbitrator in the disputes which took place in his own vicinity, the fame of his justice induced the Medes to choose him for their king after their revolt from the Assyrians. He built the city of Ecbatăna, in which he resided; after a reign of thirty-five years he left the throne to his son Phraortes.

DEIRA (de'i-ra). An ancient Anglian kingdom, stretching from the Tees to the Humber, and inland to the borders of the British realm of Strathclyde. With Bernicia it formed the Kingdom of Northumbria.

DEIRDRE (Gael.; pronounced *djer'-djiree*). An ancient Gaelic heroine famed in ancient folk tales and songs. It was prophesied at her birth that she would be the cause of enmity and strife. King Conor of Ulster had her brought up in a tower, and intended to make her his queen. She became the most beautiful woman in the world. On reaching marriageable age she eloped to Alba (Scotland) with Naios. There she lived happily until her husband and two brothers, Ardan and Ainle, were prevailed upon to return with her to Ulster, King Conor pretending that he had forgiven them. The brothers were treacherously slain, and Deirdre committed suicide at their grave.

One of the famous folk songs is Deirdre's *Farewell to Alba*. The modern neo-Celtic poets have revived Deirdre as a literary heroine in their

poems and plays. The ancient Deirdre story is part of the Cuchullin cycle of Gaelic tales which refer to events in the first century A.D.

DEIR-EL-BAHRI. Arabic name of an Egyptian temple, built by Queen Hatasu, near the site of ancient Thebes. It became a Coptic monastery in Christian times, and hence its modern name (northern convent). Under the auspices of the Egyptian Exploration Fund the site was examined by Mariette and Naville, and in 1881 thirty-nine mummies were discovered in a rock-cleft and removed to the Bulak Museum. The mummies found there included those of Amenophis I., Thothmes III., Seti I., and Rameses II.

DEIR-EL-KAMAR. *See* DAIR-EL-KAMAR.

DE'ISM (Lat. *Deus*, God). A philosophical system which, as opposed to *Atheism* (Gr. *a*, not, and *Theos*, God), recognizes a great First Cause; as opposed to *Pantheism* (Gr. *pan*, all, *Theos*), a Supreme Being distinct from nature or the universe; while, as opposed to *Theism*, it looks upon God as wholly apart from the concerns of this world. It thus implies a disbelief in revelation, scepticism as regards the value of miraculous evidence, and an assumption that the light of nature and reason are the only guides in doctrine and practice. It is thus a phase of Rationalism.

The term is restricted to the historical religious movement in England, the beginning of which may be said to have been contemporaneous with the revolution of 1688. Its epitaph was pronounced in 1790, when Burke spoke of the deistic writers as already forgotten.

In the eighteenth century there were a series of writers who are spoken of distinctively as the English deists. They include John Toland, Anthony Collins, and Matthew Tindal. This movement was so native a product of English thought, that when it was transplanted to a foreign soil it modified its character considerably.—BIBLIOGRAPHY: A. S. Farrar, *History of Free Thought*; R. Flint, *Anti-Theistic Theories*; J. M. Robertson, *A Short History of Free Thought*; Sir Leslie Stephen, *History of English Thought in the 18th Century*.

DEKKER, or DECKER, Jeremias de. A Dutch poet, born in 1609 or 1610, died 1666. His best-known poems are: *Lof der Geldzucht*, a satire on avarice; and *Puntdichten*, a collection of epigrams.

DEKKER, or DECKER, Thomas. an English dramatic and miscellaneous author, born about 1570, died 1641. He was a voluminous writer and besides a great number of pamphlets, the most famous of which i *The Guls Horne-book*, he wrote many plays which give a vivid picture o contemporary life in London. Among these are: *Old Fortunatus*, *Shoemaker's Holiday*, *Satiromastix*, an *The Honest Whore*. He also collabor ated with Massinger, Ford, Middleton, Jonson, and others. A quarre with Ben Jonson occasioned tha poet's *Poetaster*, and the *Satiromastix* of Dekker.

DELABORDE (dē-là-bōrd), **Henri François, Count.** A French general born at Dijon in 1764, died 1833. He distinguished himself in the Republican armies; fought through the whole of the Napoleonic wars, and was ennobled in 1807. After the second Restoration he was placed on the list of the officers who were to be criminally prosecuted, but in consequence of a technical error the case against him lay over, and he lived retired and unannoyed till his death.

DELACROIX (dē-là-krwă), **Ferdinand Victor Eugène.** An eminent French painter, born 1798, died 1863. He is considered the chief of the modern French romantic school of painters. His chief pictures up to 1830 are *Dante and Virgil in the Infernal Regions*, *Massacre of Chios*, *The Execution of the Doge Marino Falieri*, *The Death of Sardanapalus*, *The Murder of the Bishop of Liège*.

In 1831 he joined the embassy sent by Louis Philippe to the Emperor of Morocco. To this journey we are indebted for several pictures remarkable for their vivid realization of Oriental life as well as their masterly colouring. They are: *The Jewish Marriage*, *Muley Abderrhaman with his Body-guard*, *Algerian Ladies in their Chamber*, *Moorish Soldiers at Exercise*, and several scenes of common life. He decorated several of the public buildings of Paris, and was admitted into the Institute in 1857. He was an artist of great versatility strong in colouring but weak in drawing.—Cf. D. Bussy, *Eugène Delacroix*.

DELAGO'A BAY. In South-East Africa, a large sheet of water partly separated from the Indian Ocean by the Peninsula and Island of Inyack. The bay stretches north and south upwards of 40 miles, with a breadth of from 16 to 20 miles, and is situated near the southern extremity of the Portuguese possessions here, which surround it. It is available for vessels of large tonnage, though the presence of shoals, banks, and flats renders the navigation of the bay somewhat intricate.

The port and Portuguese settle

ent of Lourenço Marques has be-
me a place of large trade since the
ening of the gold-mines in the
ransvaal, and the construction of
e railway running inland to Pre-
ria. Steamers call regularly. A
w line from Laurenço Marques to
e Swaziland border is under con-
ruction, 44 miles being open to
affic in 1920.

DE LA MARE, Walter John. Eng-
sh poet and novelist. He was born
Charlton, Kent, 25th April, 1873,
id educated at the choir school of St.
aul's Cathedral. From 1889 to 1908
e was employed by a business firm
London, but during this time he
ecame known as a writer. His novels
clude *Henry Brocken* and *Memoirs
a Midget*. He is best known, how-
ver, for his poems, *Songs of Child-
ood*, *The Listeners and other Poems*,
nd further volumes. A collected
dition appeared in 1920. He also
rote *Crossings*, a fairy play, and
ome volumes of stories.

DELAMBRE (dė-läṅ-br), **Jean Bap-
iste Joseph.** French astronomer and
upil of Lalande, born at Amiens in
749, died 1822. His studies were not
irected to astronomy until his thirty-
ixth year, but he rapidly acquired
ame, and produced numerous works
f great value. He was engaged with
déchain from 1792 till 1799, in meas-
ring an arc of the meridian from
Barcelona to Dunkirk. In 1807 he
uccceded Lalande in the Collège de
France, and wrote his *Traité d'As-
ronomie Théorique et Pratique* (3 vols.
4to, 1814), *Histoire de l'Astronomie du
Moyen Age* (1819), *Histoire de l'As-
ronomie Moderne* (1821, 2 vols.), and
*Histoire de l'Astronomie du 18me
Siècle* (2 vols.).

DELANE', John Thaddeus. Born
1817, died 1879; became editor of
The Times in 1841, and retained that
important post till 1877, during which
time that paper attained an almost
unparalleled influence and a great cir-
culation. A biography of Delane was
published in 1908 by Arthur Irwin
Dasent.

DELAROCHE (dė-lȧ-rosh), **Hip-
polyte** (familiarly styled Paul). One
of the greatest painters of the French
school, born in Paris in 1797, died
1856. He studied landscape painting
for a short time, but applied himself
afterwards to historical painting, and
rapidly rose to eminence. His sub-
jects are principally taken from
French and English history. Among
others may be mentioned: *St. Vincent
de Paul preaching before Louis XIII.
on behalf of Deserted Children*; *Joan
of Arc interrogated in Prison by Car-
dinal Beaufort*; *The Death of Queen
Elizabeth*, a work greatly admired by
French and generally reprobated by
English critics; *The St. Bartholomew
Massacre*; *The Children of Edward
IV. in the Tower*; *Cardinal Richelieu
conducting Cinq-Mars and De Thou
up the Rhône to Execution*; *Charles I.
mocked by his Guards*; *Cromwell con-
templating the Dead Body of Charles I.*;
The Execution of Lady Jane Grey;
The Death of the Duke of Guise; and
an immense work, 27 metres long,
painted in oils on the wall of the
hemicycle of the lecture theatre at
the École des Beaux Arts, Paris. It
represents an assemblage of the great
painters, sculptors, and architects
from the days of Giotto to those of
Lesueur, and has been admirably
engraved by Dupont.

His merits consist in correct draw-
ing, appropriate expression, harmoni-
ous colour, and great distinctness and
perspicuity in treatment, rendering
the story of his pictures at once intel-
ligible. He held a middle place be-
tween the classical and the romantic
schools, and was regarded as the
leader of the so-called "eclectic
school."—Cf. Muther, *History of
Modern Painting*.

DELAVIGNE (dė-lȧ-vēny), **Jean
François Casimir.** A French poet and
dramatist, born at Havre 1793, died
1843. At the Restoration he pub-
lished a set of elegies, entitled *Les
Messéniennes*, which deplored the
faded glories of France. He produced
in 1819 his tragedy of *Les Vêpres
Siciliennes*; *Les Comédiens* appeared
in 1820, and the tragedy of *Le Paria*
in 1821. Of his other plays which
followed these may be mentioned:
L'École des Vieillards, *Marino Faliere*,
and the dramas of *Louis XI.*—
founded on Combines' *Memoirs* and
Quentin Durward—and *Don Juan
d'Autriche*. His hymns *La Parisienne*
and *La Varsovienne*, and the ballad
La Toilette de Constance, are among
his more popular poetical pieces. He
was chosen as a member of the
Academy in 1825.—Cf. F. Vuacheux,
Casimir Delavigne.

DEL'AWARE. A river of the
United States, which rises in Catskill
Mountains in New York, separates
Pennsylvania from New York and
New Jersey, and New Jersey from
Delaware, and loses itself in Delaware
Bay. It has a course of about 300
miles, and is navigable for large
vessels to Philadelphia, and for
smaller craft to the head of tide-
water at Trenton (155 miles).

DELAWARE. One of the original
thirteen United States of North
America, and, next to Rhode Island,
the smallest state in the Union, named
after Lord Delaware, one of the early
governors of Virginia. It is bounded

north by Pennsylvania, east by the Delaware River and Bay and by the ocean, south and west by Maryland; area, 2370 sq. miles. It is divided into three counties, Kent, Newcastle, and Sussex, and has nearly the form of a right-angled triangle (hence its popular name "the Diamond State").

In the south and towards the coast the surface is very level, but the north part is rather hilly. An elevated swampy tableland towards the west traverses the state, forming the watershed between the Bay of Chesapeake and the Delaware.

A great part of the soil is fertile, and agriculture is in a flourishing state. Fruit cultivation (peaches, apples, berries) is largely engaged in, and the canning and drying of fruits are important industries. There are also extensive and varied manufactures. A ship canal connects Chesapeake River and Delaware Bay. There are 325 miles of steam railway, and 83 of electric street railway. Wilmington is the chief manufacturing and commercial town. The capital is Dover.

Delaware, though slave-holding, remained loyal to the Union at the secession of the Southern States. Pop. (1930), 238,380. 32,602 being coloured.—BIBLIOGRAPHY: A. C. Myers, *Narratives of Early Pennsylvania, West New Jersey, and Delaware*; H. C. Conrad, *History of the State of Delaware*.

DELAWARE. An American city in county of same name, Ohio; a place of considerable trade; the seat of the Ohio Wesleyan University. There are celebrated medicinal springs in the vicinity. Pop. 9076.

DELAWARE BAY. An estuary or arm of the sea between the states of Delaware and New Jersey. At the entrance, near Cape Henlopen, is situated the Delaware Breakwater, which affords vessels a shelter within the cape. It was erected by the Federal Government, and cost about £600,000.

DELAWARE INDIANS. A tribe belonging to the Algonquin family, originally known as living on the Delaware River, and called by themselves *Lenni Lenape*. They had to leave their original settlements about the middle of the eighteenth century, going farther west, and after the war of 1812 they were removed to the Indian Territory. Their numbers are now insignificant (about 1000).

DE LA WARR, Baron. English title. It dates from 1299, when Roger de la Warr, a landholder in Sussex, became a baron. In 1426 it was inherited by Reginald West, a descendant in the female line. His descendant, Thomas, the 12th baron (1577–1618), was the first governor of Virginia. The state and river of Delaware were named after him. John, the 16th baron, was made an earl in 1761. The 5th earl married a daughter of the Duke of Dorset, and since then the family name has been Sackville-West. Herbert Edward Sackville who became the 9th earl in 1915, was a member of the Labour ministry in 1924 and again in 1929–31, and joined the National Government as Under-Secretary for Agriculture.

DELBRUCK, Hans. German historian, born in 1848 in Bergen, on the Island of Rügen. Educated at Heidelberg, Greifswald, and Bonn, he was for a time von Ranke's secretary. He was a member of the Reichstag from 1884 to 1890, in 1883 became editor of the *Preussische Jahrbücher*, and in 1885 professor of history at the University of Berlin.

Delbrück is chiefly known as an authority on the art of war. His works include: *The Strategy of Pericles illustrated by that of Frederick the Great* (1890); *Frederick, Napoleon, and Moltke: Old and New Strategy* (1892); *History of the Art of War* (3 vols. 1900-7); and *Numbers in History* (1914). He died in 1929.

DELCASSÉ, Théophile. French statesman, born at Pamiers in 1852. Educated at Toulouse, he started life as a journalist, contributing articles on foreign politics to *La Republique Française*. In 1887 he was elected to the Chamber of Deputies, became Under-Secretary of State for the Colonies in 1893, and Colonial Minister in 1894. He was Foreign Minister in the Brisson Cabinet in 1898, and retained his office for seven years, during which France passed through various crises, such as the Fashoda affair, the Dreyfus case, and the separation of Church and State.

As Foreign Minister Delcassé was one of the founders of the Anglo-French Entente, and brought about the Franco-Russian Alliance. His policy of alliances, which aimed at the isolation of Germany, was distasteful to Berlin, so that when the Morocco crisis broke out, and France was confronted by the threat of war, Delcassé, who had adopted a resolute attitude towards Germany, was compelled to resign. From 1905 to 1912 he was Minister of Marine, and introduced a very elaborate programme for the improvement of the French navy. French Ambassador at St. Petersburg from 1913 to 1914, he returned to the Foreign Office at the outbreak of the European War, but had to resign in Oct., 1915, on account of ill-health. He died in 1923.

DEL CREDERE COMMISSION. Additional commission paid by a principal to his agent, in consideration of which the agent guarantees fulfilment of the contracts into which he enters on his principal's behalf. It occurs most frequently in the sale of goods. In England the liability of the agent does not emerge until there has been default on the part of the buyer.

DEL'EGATE. A person appointed and sent by another or by others, with powers to transact business as his or their representative. The title was given to members of the first continental congress in America, 1774. Representatives to Congress from the United States Territories are still designated by this term. They have the right of discussion, but have no vote.

DELEGATES, High Court of. A supreme court of appeal in ecclesiastical causes, set up in England in 1533, and abolished in 1832. All appeals from ecclesiastical courts now go to the judicial committee of the Privy Council.

DELESCLUZE (dė-lā-klüz), **Louis Charles.** A French Communist, born in 1809. He adopted a journalistic career, and was imprisoned and fined for his socialistic and revolutionary articles, and also sentenced to banishment. He escaped to England, but having returned to France (1853) was kept in prison for some time and then banished to Cayenne. On his return he again got into trouble, for advocating the principles of the *Association internationale des travailleurs*, known as the *Internationale*. After the fall of the empire and the German occupation, he became a prominent member of the Commune, and was shot at one of the barricades in 1871. He published *De Paris à Cayenne : journal d'un transporté*.

DELESSERIACEÆ. A family of Red Algæ, including many beautiful forms, such as Delesseria, with flat leaf-like fronds; Nitophyllum, not unlike dulse but far more delicate; Plocamium; and the extraordinary lace-like Claudea.

DELFS'HAVEN. A town of Holland, on the Maas, 2 miles S.W. of Rotterdam, in which it is now incorporated. It is well protected from inundation by dikes, and has ample accommodation for shipping. It was at Delfshaven that the Pilgrim Fathers embarked for America on 22nd July, 1620.

DELFT, formerly DELF. A town, Holland, 8 miles N.W. of Rotterdam, intersected in all directions by canals. Among its buildings are the town hall, dating from 1618; the Prinsen-hof, the scene of the assassination of William the Silent, now a military barracks; the old Reformed Church, containing the monuments of Admiral Tromp and of the naturalist Leeuwenhoek; the new church, containing monuments to William I., Hugo Grotius, and the burial-vaults of the present Royal family. Delft was formerly the centre of the manufacture of the pottery called *delft-ware*; its chief industries now are carpets, leather, soap, oil, and gin. Pop. (1932), 51,286.

DELFT-WARE, or DELF. A kind of pottery covered with an enamel or white glazing which gives it outwardly the appearance of porcelain.

Delft-ware, or Delf

It was originally manufactured in Delft in the fourteenth century, was decorated with designs in blue, and was among the best pottery-ware of its day. Ware of the same kind is still made at various places.

DELFZYL (delf'zil). A seaport of North Holland, province of Groningen, on the Dollart or Ems estuary, at the end of a canal running inland to Groningen. It carries on fishing and shipping. Pop. 7460.

DELHI (del'i). A city of India, in the Punjab, anciently capital of the Patan and Mogul Empires, since 1912 capital of the Indian Empire and seat of government, situated about 954 miles north-west of Calcutta. It was at one time the largest city in India, covering a space of 20 sq. miles, and having a population of 2,000,000. A

vast tract covered with the ruins of palaces, pavilions, baths, gardens, and mausoleums marks the extent of the ancient metropolis.

The present city abuts on the right bank of the Jumna, and is surrounded on three sides by a lofty stone wall 5½ miles long, with ten gates, the river-side being unwalled. The palace or residence of the Great Mogul, built by Shah Jehan (1638–48), and now known as "the fort," covers a large area in the east of the city, and abuts directly on the river. It is surrounded on three sides by a high wall of reddish sandstone, with round towers at intervals, and a gateway on the west and south. Some fine portions of the palace still remain alongside modern structures.

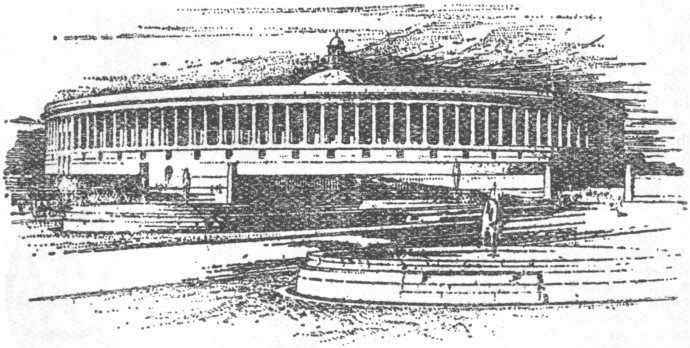
One of the most remarkable buildings in the city is the Jamma Musjid or Great Mosque, a magnificent structure in the Byzantine-Arabic style, built by Shah Jehan in the seventeenth century. Among modern buildings are the Government college, founded in 1792 (abolished as a college); the Residency, and a Protestant church. The East Indian Railway enters the city by a bridge over the Jumna, other railways entering on the west.

The south-west quarter of the town is densely occupied by the shops and dwellings of the native population; the streets are narrow and tortuous, but some of the main thoroughfares of the city are splendid streets, the chief being the Chandni Chauk, or "Silver Street."

History.—Delhi, anciently called Indraprastha, is one of the oldest cities in India, being known by its present name in the first century B.C. It has at various times undergone great vicissitudes, being frequently taken and devastated by hostile powers, including the Mahrattas, from whom it was wrested by Lord Lake in 1803. During the Mutiny Delhi was seized by the rebel sepoys, who made it the centre of their operations until it was captured by Generals Wilson and Nicholson.

In 1912 it was decided to make Delhi the capital of India, and on a site to the south of the city New Delhi has been built—a modern city with magnificent buildings, chief of which are the Council House (opened in 1927), Government House, and two secretariat buildings. It was planned by Sir Edwin Luytens. Pop. 447,442.

The province of Delhi was constituted in 1912, and consists of a small enclave in the Punjab. Area, 573 sq. miles; pop. (1931), 636,246.—BIBLIOGRAPHY: H. C. Fanshawe, *Delhi, Past and Present*; G. Festing, *When Kings rode to Delhi*; G. W. Forrest, *Cities of India*; G. R. Hearn, *The Seven Cities of Delhi*.



The Circular Exterior of the Indian Parliament House in the New Delhi. The actual Parliament House is inside the surrounding colonnade

DELIBES (dē-lēb), **Léon.** French composer, born 1836, died 1891; his works are mostly of a bright, graceful, and cheerful cast, and include operettas, comic operas, and ballet music. In collaboration with Georges Bizet and others he wrote the operetta *Malbrouk s'en va-t-en guerre*. His first important dramatic work was *Le roi l'a dit*. Other works are the operas *Jean de Nivelle* and *Lakmé*; the latter, produced in 1883, is his most popular opera.

DELILLE (dē-lēl), **Jacques.** A French didactic poet, born in 1738, died 1813. His translation of Virgil's

Georgics, published in 1770, with a *Discours Préliminaire* and numerous annotations, established his fame, and obtained him admission to the French Academy. He became professor of Latin poetry in the Collège de France, and of belles-lettres at the University of Paris.

Though an adherent of the old system, Robespierre spared him on every occasion. At his request Delille wrote the *Dithyrambe sur l'Immortalité de l'Âme*, to be sung on the occasion of the public acknowledgment of the Deity. In 1794 he withdrew from Paris, but returned again in 1801, and was chosen a member of the Institute. He spent two years in London, chiefly employed in translating *Paradise Lost*.

His reputation, which declined very much after his own day, mainly rests on his translation of the *Georgics*, and on *Les Jardins*, a didactic poem.—Cf. Sainte-Beuve, *Portraits littéraires*.

DELIQUES'CENCE. A change of form from the solid to the liquid state, by the absorption of moisture from the atmosphere. It occurs in many bodies, such as caustic potash, carbonate of potassium, acetate of potassium, chloride of calcium, cupric chloride, and chloride of zinc.

DELIR'IUM (Lat. *delirare*, to be mad, from *de*, off, away, and *lira*, furrow, literally "being off the straight line"), a temporary disordered state of the mind, accompanied by senseless rambling and incoherent speech. It may be the effect of direct injury or disordered or inflammatory action affecting the brain itself, or of a very high temperature; it may be caused by long-continued and exhausting pain.

DELIR'IUM TRE'MENS. A peculiar form of acute mania which arises from the inordinate and protracted use of alcohol. The principal symptoms of this disease, as its name imports, are delirium and trembling. The delirium is a constant symptom, but the tremor is not always present, or, if present, is not always perceptible. Frequently the sufferer thinks he sees the most frightful, grotesque, or extraordinary objects, and may thus be put into a state of extreme terror. The common treatment is to administer soporifics so as to get the patient to sleep.

DELISLE (dē-lēl), **Guillaume.** French geographer, born in 1675, died 1726. He adopted entirely new principles of cartography, and set about making a thorough reform in that subject. He published upwards of 130 maps, and reconstructed the system of geography current in Europe in the beginning of the eighteenth century. Louis XV. appointed him Geographer to the King.

DELISLE, Joseph Nicolas. Brother of the preceding, born 1688, died 1768, was a distinguished astronomer, geographer, and mathematician. He visited England, where he formed acquaintance with Newton and Halley. His chief work was *Mémoire pour servir à l'Histoire del'Astronomie, de la Géographie et de la Physique*.

DELISLE, Leopold Victor. French bibliographer and historian, born 1826, died 1910. In 1874 he became general director of the Bibliothèque Nationale in Paris. His works include: *Le Cabinet des Manuscripts de la Bibiotheque Nationale* (3 vols., 1868-81), *Les Bibles de Gutenberg* (1894), and *Recherches sur la librairie de Charles V.* (1907).

DELITZSCH (dā'lēch), **Franz.** German Protestant theologian and Hebrew scholar, born in 1813, died in 1890. He was a strong supporter of orthodoxy; became professor of theology at Rostock in 1846, at Erlangen in 1850, and at Leipzig in 1867. He published many devotional and theological works, was learned in Hebrew and rabbinical lore, exerted himself in connection with the conversion of the Jews, translated the New Testament into Hebrew, and founded the Institution Judaicum or Delitzschianum at Leipzig.

DELITZSCH, Friedrich. Son of the preceding, born 1850, is distinguished in Assyriology, and has been professor at Leipzig, at Breslau, and since 1899 at Berlin. He has published various works connected with Hebrew and Assyrian philology, including an *Assyrian Dictionary*, an *Assyrian Grammar*, an *Assyrian Manual*, and a *Sumerian Grammar*. Lectures delivered by him in 1902 and 1903, entitled *Babel und Bibel*, gave rise to much controversy, in which the ex-Emperor William II. took part. He died in 1922.

DELITZSCH (dā'lēch). A town of Prussian Saxony, on the Löbber or Lober, 15 miles north of Leipzig, with industries connected with tobacco, sugar, shoes, brewing, and milling. Pop. 14,890.

DELIUS, Frederich. British composer. He was born of German parents, 29th Jan., 1863, in Bradford, Yorksnire, and in 1883 he went to Florida as manager of an orange plantation. He gave up business for music, to which he had hitherto devoted his leisure, and in 1886 went to Leipzig where he studied composition. In 1890 he settled in Paris.

His important works include concertos for violin, violoncello, piano, and violin and 'cello combined; *Appalachia*, *Sea-Drift*, *Requiem*, and other choral works; *Paris Brigg Fair*, *On Hearing the First Cuckoo in Spring*, and other orchestral works. In 1932 he produced an opera, *Koanga*. *A Village Romeo and Juliet* is his best-known musical drama. He was made a Companion of Honour in 1929, and six festival concerts were held in his honour in London.

DELIVERY (Lat. *deliberare*, to free). Essential element in transference of property. It vests in the transferee the same control as the transferor possessed before the act. It may be real (actual), as where goods are passed from hand to hand; constructive, involving no change of custody, as where A, owner and custodier of goods, sells to B and undertakes to hold for him; or symbolical, as where formerly in transferring land a clod of earth was given to the transferee.

DELLA CRUSCANS. A coterie of English poetasters resident for some time in Florence, who printed inferior sentimental poetry and prose (*The Florence Miscellany*) in 1785. Coming to England, they communicated the infection to minds of a like stamp, and the newspapers of the day, chiefly *The World* and *The Oracle*, began to give publicity to their lucubrations. They were extinguished by the bitter satire of Gifford's *Baviad* (1794) and *Mœviad* (1796). Mrs. Piozzi, Boswell, Merry, Cobb, Holcroft, Mrs. H. Cowley, and Mrs. Robinson were the leaders. They took the name from the Accademia della Crusca in Florence.

DELLA ROBBIA, Luca. Italian sculptor, born 1400 at Florence, died 1482. He was distinguished for his work both in marble and bronze, and also for his reliefs in terra-cotta coated with enamel, a kind of work named after him. Other members of the family distinguished themselves in the same line, especially Andrea (1435-1525), nephew nephew and pupil of Luca.

DELLA ROBBIA WARE. Terra-cotta bas-reliefs thickly enamelled with tin-glaze; made at Florence (chiefly between 1450 and 1530); in France (1530-67); so called from the name of the above artist.

DELLYS. A seaport of Algeria, 49 miles E. of Algiers. It consists of a French and an Arab town; the climate is salubrious, and there is a trade in grain, oil, and salt. Pop. 18,864.

DELOLME (dē-lolm), **Jean Louis.** Swiss writer, born at Geneva in 1740, died 1806. He at first practised as a lawyer in his native city, but the part which he took in its internal commotions obliged him to repair to England, where he passed some years in great indigence. He became known by his once-celebrated but superficial *Constitution de l'Angleterre*. This work was translated by the author himself into English in 1772. Delolme also published in English his *History of the Flagellants, or Memorials of Human Superstition* (1783); and *An Essay on the Union with Scotland* (1796). He returned to Switzerland about 1775.

DELORME (dē-lorm), **Marion.** A celebrated French beauty who reigned under Louis XIII. The date of her birth is given as 1611, 1612, and 1615. Her beauty and wit soon made her house the rendezvous of all that was gallant and brilliant in Paris. She espoused the side of the Frondeurs, and Mazarin was about to have her arrested when her sudden death terminated her short career of thirty-nine years.

The legend is current in France that the death and funeral was a mere pretence; that she escaped to England, returned to Paris, and after marrying three husbands lived to the age of 129. Victor Hugo has taken her as the subject of one of his dramas, and G. Bottesini of one of his operas. Alfred de Vigny described her fate in his novel *Cinq-Mars*.—Cf. J. Péladan, *Histoire et légende de Marion de Lorme*.

DE'LOS. An island of great renown among the ancient Greeks, fabled to be the birthplace of Apollo, It was a centre of his worship, and the site of a famous oracle. It is the central and smallest island of the Cyclades, in the Ægean Sea, a rugged mass of granite about 12 sq. miles in extent. At first the island, occupied by the Ionians, had kings of its own, who also held the priestly office. In 477 B.C. it became the common treasury of the Greeks who were leagued against Persia. Subsequently the Athenians removed the inhabitants from it, but they were soon restored. Its festivals were visited by strangers from all parts of Greece and Asia Minor. After the destruction of Corinth (146 B.C.) the rich Corinthians fled thither, and made Delos the seat of a flourishing commerce.

The greatest curiosity of the island was the Temple of Apollo. The Persians, when they made war against Greece, forebore attacking the island out of reverence to the

patron deities. The Delians showed great skill and taste in making utensils, statues of their gods, and figures of heroes and animals in bronze and silver.

Delos, called *Dili* or *Sdili*, is now without permanent inhabitants; a few shepherds from the neighbouring isles pay it summer visits with their flocks. Abundant ruins of its former magnificence yet exist, and excavations resulting in interesting archæological discoveries have been made since 1877.—Cf. Sir R. C. Jebb, Article in *Journal of Hellenic Studies* (1889).

DELPHI. An ancient Greek town, originally called Pytho, the seat of the famous oracle of Apollo, was situated in Phocis, on the southern side of Parnassus, about 8 miles N. of the Corinthian Gulf. It was also one of the meeting-places of the Amphictyonic Council, and near it were held the Pythian games. The oracles were delivered by the mouth of a priestess who was seated on a tripod above a subterranean opening, whence she received the vapours ascending from beneath, and with them the inspiration of the Delphian god. The oracular replies were always obscure and ambiguous; yet they served in earlier times, in the hands of the priests, to regulate and uphold the political, civil, and religious relations of Greece.

The oracle was celebrated as early as the ninth century B.C., and continued to have importance till long after the Christian era, being at last abolished by the Emperor Theodosius. Persons came to consult it from all quarters, bestowing rich gifts in return. The splendid temple thus possessed immense treasures, and the city was adorned with numerous statues and other works of art. It first lost its treasures in 357 B.C., when seized by the Phocians; it was afterwards plundered by Sulla and by Nero, while Constantine also removed several of its treasures.

The site of the town is now occupied by a village called *Castri*, near which may be seen the still-flowing Castalian spring. Excavations have been made here, and monuments discovered since 1880.—BIBLIOGRAPHY: Sir J. G. Frazer, *Pausanias* (vol. v.); L. R. Farnell, *Cults of the Greek States*; Baedeker, *Greece*.

DELPHIN CLASSICS. A collection of the Latin classic authors made for the dauphin (Lat. *in usum Delphini*), son of Louis XIV., under the editorship of Bossuet, Huet, and others, with notes and interpretations (1674-1730). The Delphin Classics comprise 64 volumes. A similar series based on these was published in London.

DELPHINIUM. Genus of hardy ranunculous plants, both biennial and perennial. Delphiniums bear tall spikes of blue, mauve, or purple blooms, in many beautiful varieties. They are grown from seed planted in April, and the seedlings transplanted for blooming the following year.

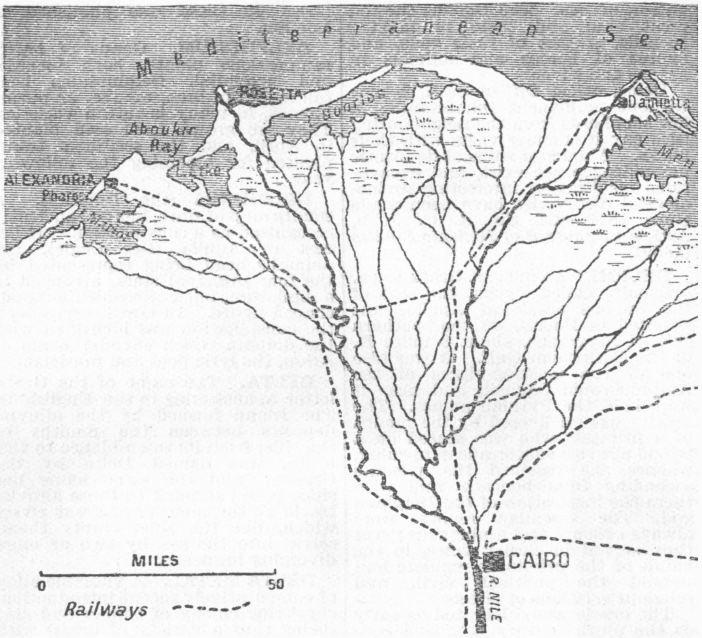
DELPHINUS (the Dolphin). A small group of stars, but one anciently recognized as a constellation. It lies east of Aquila (the Eagle), the animal's head being represented by the four principal stars, arranged in a miniature, but noticeable diamond-shaped figure. In Greek mythology the constellation was identified with the dolphin which saved the life of Arion, the lyric poet and musician.

DELTA. The name of the Greek letter Δ, answering to the English D. The island formed by the alluvial deposits between the mouths of the Nile, from its resemblance to this letter, was named Delta by the Greeks; and the same name has since been extended to those alluvial tracts at the mouths of great rivers which, like the Nile, empty themselves into the sea by two or more diverging branches.

DELTA METAL. A valuable alloy of comparatively recent introduction, consisting chiefly of copper and zinc (being thus a variety of brass) with the addition of small quantities of iron, lead, and manganese. The proportions of the chief component metals are about 56 copper, 40 zinc, 1 iron, 1 lead, and 1 manganese. It is of a yellowish or golden colour, and in certain respects superior to malleable iron or steel. It may be rolled either hot or cold, drawn out into wire, is easily forged, and becomes very fluid when melted, so as to be easily cast into small articles, being also very suitable for artistic objects. It is much used for fittings and parts of machinery of various kinds, and for ships' sheathings and screws.

DEL'TOID MUSCLE. A muscle of the shoulder. By its action it helps to move the arm outwards from the body, and it also helps to rotate the arm.

DELUC (dė-lŭk), **Jean Andre.** A geologist and meteorologist, was born in 1727 at Geneva, died at Windsor 1817. In 1773 he came to England, was elected a fellow of the Royal Society of London, and appointed reader to the queen, a situation he held for forty-four years. He made numerous geological ex-



The Nile Delta

cursions in Central Europe, and in England, of which he published accounts. He aimed at defending the Mosaic account of the creation against the criticism whose weapons were furnished by his favourite science. He made many valuable original experiments in meteorology.

Among his numerous writings are his *Recherches sur les Modifications de l'Atmosphère* (Geneva, 1772), *Nouvelles Idées sur la Météorologie* (London, 1786), *Bacon tel qu'il est* (Berlin, 1800), *Lettres sur le Christianisme* (Berlin, 1801), and his *Traité élémentaire de Géologie* (Paris, 1809, also in English).

DEL'UGE. The universal inundation which, according to the Mosaic history, took place to punish the great iniquity of mankind. It was produced, according to Genesis, by a rain of forty days; and covered the earth 15 cubits above the tops of the highest mountains, and killed every living creature except Noah, with his family, and the animals which entered the ark by the command of God.

Many other nations mention, in the mythological or prehistoric part of their history, inundations which in their essential particulars, agree with the Scriptural account of Noah's preservation, each nation localizing the chief events and actors as connected with itself.

DELUN'DUNG. The local name of species of Prionodon, pretty little carnivores, native to South-East Asia, and belonging to the civet-cat family, though in certain characters they approach the Felidæ. They are of slender form, with long tails, and are beautifully spotted.

DELVI'NO. A town of Albania about 44 miles N.W. of Janina; it is the seat of a Greek bishop, and has some trade in olive-oil. Pop. about 8000.

DEMAGOGUE (dem'a-gog). Originally simply one who leads or directs the people in political matters; now it usually means one who acquires influence with the populace by pandering to their prejudices or playing on their ignorance.

EMAND AND SUPPLY. Terms
d in economics to express the
tions between consumption and
duction, between the demand of
chasers and the supply of com-
dities by those who have them to
. The relations which subsist
ween the demand for an article
l its supply determine exchange
ue, which in terms of money is
led its price. When the demand
a commodity exceeds the supply,
price of the commodity is raised;
l when the supply exceeds the
nand, the price falls. The terms
, however, only a convenient
ans for dividing into two groups
forces determining value. Over
ort periods these are almost end-
s; over long periods cost of pro-
ction is the ruling influence. If
price received does not cover
s, the supply will decrease until
price rises sufficiently to do so.
nilarly, if the price is greater than
st of production, and there is free
mpetition, manufactures will in-
ease the supply until the price falls
cost of production level.

DEMAVEND (de-mä'vend). A volc-
nic mountain of Persia, and the
ghest peak of the Elbruz chain,
miles S. of the Caspian Sea and
out 40 miles N.E. of Teheran. Its
ight is about 18,464 feet, and it
ars evidence of having been active
ring the latest geological (if not
thin the historic) period.

DEM'BEA, or TSANA. A lake of
byssinia, in a province of the same
me in the west part of that country.
is of irregular form, about 140

Delundung (*Prionodon gracilis*)

miles in circumference, has an elevation of 6100 feet above the sea, and forms the reservoir of the Blue Nile.

DEMBIN'SKI, Henryk. A Polish general, and leader in the Hungarian revolution of 1849; born in 1791, died in 1864. He served under Napoleon during the Russian campaign of 1812; was Governor of Warsaw and commander-in-chief of the Polish army during the revolution of 1830; was appointed by Kossuth commander of the Hungarian troops in 1849, and served till Kossuth's resignation compelled him to seek refuge in France, where he remained till his death.

DEMEN'TIA. A form of insanity in which unconnected and imperfectly defined ideas chase each other rapidly through the mind, the powers of continued attention and reflection being lost. It often implies such general feebleness of the mental faculties as may occur in old age, but is seen in its most pronounced form in the last stage of general paralysis of the insane, or, in fact, of any kind of chronic insanity. *See* INSANITY.

DEMERA'RA, or DEMARARA. A division of British Guiana, which derives its name from the River Demerara or Demarara.

DEMESNE (de-mān'), or **DOMAIN** (Lat. *dominicum*, belonging to a lord or master). In law, a manor-house and the land adjacent or near, which a lord keeps in his own hands or immediate occupation for the use of his family, as distinguished from his tenemental lands, distributed among his tenants. *See* COPYHOLD.

DĒMĒ'TĒR. One of the twelve principal Grecian deities, the great mother-goddess, the nourishing and fertilizing principle of nature. She was the daughter of Cronus and Rhea, and mother of Persephŏnē (Proserpine). The main feature in the myth of Demeter, and that which forms the fundamental idea of her worship, is the loss and recovery of her daughter, Persephŏnē. By the Romans she was called *Ceres*.—BIBLIOGRAPHY: L. Dyer, *The Gods in Greece*; Sir J. G. Frazer, *The Golden Bough*.

DEMET'RIUS, or DMITRI. The name of a series of impostors who usurped supreme authority in Russia, and led to some of its remarkable revolutions. Ivan Vasilievitsh, who had put his eldest son to death with his own hand, left the throne in 1584 to another son, Fedor, a feeble prince, whom Boris Godunov entirely supplanted in his authority.

Ivan had left another son, Dmitri, by a second marriage; and Boris,

fearing that he might one day prove a formidable obstacle to his ambitious projects, made away with him, but no one exactly knew how. Grishka, or Gregory Otrepiev, a native of Jaroslav and a novice in a monastery, personated Dmitri, went to Lithuania, where he embraced the Roman Catholic religion and married the daughter of Mniszek, Palatine or Woiwod of Sandomir. In 1604 he entered Russia at the head of a body of Poles, was joined by a number of Russians and Cossacks, and defeated an army sent against him.

On the death of Boris he was placed on the throne, but he offended the Russians by his attachment to Polish manners and customs, and still more by a want of respect to the Greek religion and its patriarch, and he was assassinated after reigning about eleven months. A rumour of his being still alive having spread, another impostor quickly appeared to personify him, and the Poles, espousing the cause of the second false Dmitri, made it triumphant, until he was assassinated in 1610 by the Tartars whom he had selected as his bodyguards. A state of anarchy ensued and continued for nearly half a century, during which a number of other false Dmitris appeared in different quarters.—BIBLIOGRAPHY: R. N. Bain, *Poland and Russia*; P. Mérimée, *Les faux Demetrius*; S. E. Howe, *The False Dmitri*.

DEMET'RIUS, surnamed *Poliorcētes* (the besieger of cities). King of ancient Macedonia, son of Antigonus, a successor of Alexander the Great, was born about 339 B.C. Being sent by his father to wrest Greece from Cassander, he appeared before Athens with a fleet, expelled the Governor Demetrius Phalerus, and restored to the people their ancient form of government (307 B.C.). He conquered Macedonia (294 B.C.) and reigned seven years, but lost this country, was imprisoned by Seleucus, and died in Syria 283 B.C.

DEMETRIUS PHALEREUS (fa-lē'rŭs). A celebrated Greek orator and statesman, born 345 B.C.; in 317 he was made Macedonian Governor of Athens, and caused many fine buildings to be erected. He fled to Egypt when Athens was taken by Demetrius Poliorcetes, where he is said to have promoted the establishment of the Alexandrian Library and of the museum. Demetrius wrote on several subjects of philosophical and political science, but the work on rhetoric, *Peri Hermēneias* (On Style), which has come to us under his name, belongs to a later age.

DEMI-MONDE. An expression first used by the younger Dumas in a drama of the same name (first performed in 1855), to denote that class of gay female adventurers who are only half-acknowledged in society; popularly, disreputable female society; courtezans.

DEMISE' (literally "a laying down"). In law, a grant by lease; it is applied to an estate either in fee-simple, fee-tail, or for a term of life or years. As applied to the Crown of England, *demise* signifies its transmission to the next heir on being laid down by the sovereign at death. The law by which the death of the sovereign dissolved Parliament was abolished by the Representation of the People Act, 1867.

DEM'IURGE (Gr. *dēmiourgos*, a handicraftsman). A designation originally used to designate any craftsman plying his craft or trade for the use of the public. It was then applied by Plato and other philosophers to the Divine Being, considered as the Architect or Creator of the universe. The Gnostics made a distinction between the Demiurge and the Supreme Being; with them the first is the Jehovah of the Jews, who, though deserving to be honoured as the Creator, was only the instrument of the Most High.

DEMMIN. An old town of Prussia, province of Pomerania, 70 miles W.N.W. of Stettin, with manufactures of woollen and linen cloth, hats, leather, hosiery, and tobacco; and a good trade. Pop. 12,787.

DEMOCRACY. In political science, as contrasted with aristocracy or autocracy, is the rule of a people by itself, either directly or by means of representatives. In the city-states of Greece, the citizens were regularly called together for legislative or other purposes, and voted directly on any issue, the system being made workable by citizenship being restricted to a limited number.

This method of democratic government served to a limited extent in the city-states of mediæval and renaissance Europe, but became impracticable with the growth of imperial- and nation-states; and after a phase of government by one man or a small group of men, the method of representation developed. The system first took workable shape in England, and her parliamentary system has inspired the constitutions of the United States, of all British colonies, and of many European states.

The representative principle has been applied in varying degrees, the

right to vote sometimes being severely restricted, sometimes being extended to all adults. The direct method has never been entirely abandoned, however. It survives to a limited extent in the election of the President of the United States, and in provisions such as exist in Switzerland for taking a *plébiscite* or direct vote on certain questions.

Feeling in favour of direct action has recently been growing, especially in industrial affairs. This has found expression in the Syndicalist and National Guild movements, which aim at putting control of industry into the hands of those actually engaged therein.

The term democracy is also sometimes used to describe the whole people of a state, especially in a democratic state, as distinct from the aristocracy or monarch.—BIBLIOGRAPHY: Sir H. Maine, *Popular Government*; W. E. H. Lecky, *Democracy and Liberty*; T. E. May, *Democracy in Europe*; L. T. Hobhouse, *Democracy and Reaction*; J. A. Hobson, *Democracy after the War*; J. Holland Rose, *The Rise of Democracy*.

DEM'OCRAT. One in favour of democracy. In the United States, a member of one of the two great political parties into which that country is divided, in contradistinction to *Republican*. The party stands mainly for decentralization and self-government of the states, as opposed to an increase in the power of the Federal (Central) Government. The use of the doctrine of states rights in defence of slavery led to the American Civil War. The chief strength of the party still lies in the south, save in industrial districts.

DEMOC'RITUS. A Greek philosopher of the new Eleatic school, a native of Abdera, who was born about 470 or 460 B.C. He travelled to Egypt, where he studied geometry, and probably visited other countries, to extend his knowledge of nature. Among the Greek philosophers he enjoyed the instruction of Leucippus. He afterwards returned to his native city, where he was placed at the head of public affairs. Indignant at the follies of the Abderites, he resigned his office and retired to solitude, to devote himself exclusively to philosophical studies.

According to later biographers he was called "the laughing philosopher," from his habit of laughing at the follies of mankind. His importance, however, lies in his being the pioneer of materialism and the mechanical explanation of the universe.

His system of philosophy is known as the atomic system. In this system he developed still further the mechanical or atomical theory of his master Leucippus. Thus he explained the origin of the world by the eternal motion of an infinite number of invisible and indivisible bodies or atoms, which differ from one another in form, position, and arrangement, and which have a primary motion which brings them into contact, and forms innumerable combinations, the result of which is seen in the productions and phenomena of nature. In this way the universe was formed, fortuitously, without the interposition of a First Cause.

The eternal existence of atoms (of matter in general) he inferred from the consideration that time could be conceived only as eternal and without beginning. He applied his atomical theory, also, to natural philosophy and astronomy. Even the gods he considered to have arisen from atoms, and to be perishable like the rest of things existing.

In his ethical philosophy Democritus considered the acquisition of happiness, by which he understood serenity and peace of mind, as the highest aim of existence. He is said to have written a great deal; but nothing has come down to us except a few fragments. He died 370 B.C., at an advanced age. His philosophy was supplanted by that of Epicurus. *See* LEUCIPPUS; LUCRETIUS.—BIBLIOGRAPHY: T. Gomperz, *Greek Thinkers*; F. A. Lange, *History of Materialism*.

DEMOGOR'GON. A mysterious divinity in pagan mythology, viewed as an object of terror rather than of worship, by some regarded as the author of creation, and by others as a famous magician, to whose spell all the inhabitants of Hades were subjected. Demogorgon is mentioned by Spenser and Milton, and by Shelley in his *Prometheus Unbound*.

DEMOG'RAPHY (Gr. *demos*, people, and *graphein*, to write). The science or branch of knowledge which deals with the facts or phenomena presented by human communities, and capable of being treated comparatively by means of statistics referring to births, marriages, deaths, health and disease, education, crime, etc.

The term was first used by Achille Guillard in his *Éléments de Statistique Humaine ou démographie comparée*, but the French statistician, M. Block (1816-1901), gave the word a wider meaning. He defined demography as "the science of man living in

society, in so far as it can be expressed by figures." It may be regarded as a department of anthropology in the widest sense. *See* STATISTICS.

DEMOISELLE. (1) The Numidian crane (*Anthropoides virgo*), ranging from South Europe through Turkistan and Siberia to China, and visiting Africa in the winter. It is about 3 feet in length, and differs from the true cranes in having the head and neck quite feathered and the inner secondaries of the wings elongated and hanging over the tail. It owes its name to its gracefulness and symmetry of form.

(2) Small and graceful dragon-flies of the genus Calepteryx. They exhibit beautiful metallic tints, and in some species the wings of the two sexes are of different colours.

DEMOIVRE (dē-mwä-vr), **Abraham.** A French mathematician, born in 1667, died in London 1754. He settled in London after the revocation of the Edict of Nantes, and gained a livelihood by becoming a teacher of mathematics. His chief works are: *Miscellanea Analytica*; *The Doctrine of Chances, or a Method of Calculating the Probabilities of Events at Play*; *A Treatise on Annuities*; besides papers in the *Transactions of the Royal Society*, of which he was a fellow.

DE'MON (Gr. *daimōn*). A spirit or immaterial being of supernatural but limited powers, especially an evil or malignant spirit. Demons and spirits must be distinguished from ghosts or souls, as well as from gods, although confusion is frequent. Among the ancient Greeks the name was given to beings similar to those spiritual existences called angels in the Bible. In the New Testament evil spirits are called demons (commonly translated "devils").

A belief in demons is found in the oldest religions of the East. Buddhism reckons six classes of beings in the universe: two, gods and men, are accounted good; the other four are malignant spirits. The Persians and the Egyptians had also a complete system of demons; and in Europe, up till the Middle Ages, the divinities of Oriental, classical, and Scandinavian mythology often figure, from the Christian point of view, as evil spirits. In later times phases of demonology may be seen in the witchcraft mania and the spiritualism of the present day.

DEMONOL'OGY. That branch of comparative religion which deals with the belief in supernatural beings, evil spirits and demons, capable of exercising an influence upon human life. The worship of such supernatural beings and demons is very widespread, and existed among all nations, Aryan and Semitic alike.

Primitive man, in his endeavour to explain the physical phenomena of the universe, imagined the latter as pervaded by and peopled with numerous supernatural beings, either of unearthly origin, or the departed souls of mortals. To his primitive mind the facts of nature which he could not otherwise comprehend, and which greatly puzzled him, were thus explained under the category of personality.

Closely related with demonology is the modern *Diabolism* or *Satanism*, which finds its culmination in the Black Mass.—BIBLIOGRAPHY: E. B. Tylor, *Primitive Culture*; Conway, *Demonology and Devil-lore*; Sir J. G. Frazer, *The Golden Bough*.

DEMONSTRATION. In a logical sense, any mode of connecting a conclusion with its premises, or an effect with its cause. In a more rigorous sense it is applied only to those modes of proof in which the conclusion necessarily follows from the premises. In ordinary language, however, demonstration is often used as synonymous with *proof*.

DEMON'TE. A town, North Italy, on the Stura, 14 miles S.W. of Cuneo. Pop. over 6000.

DE MORGAN, Augustus. Mathematician and logician, was born at Madura, in Southern India, 1806, died 1871. He was educated at Cambridge, gaining the fourth place in the mathematical tripos in 1827. The following year he was appointed professor of mathematics in the University College, or, as it was then called, London University—a position which he held until 1866, with the exception of the five years from 1831 to 1836.

His writings are very numerous, and include: *Elements of Arithmetic*, *Elements of Algebra*, *Elements of Trigonometry*, *Essay on Probabilities and on their Application to Life Contingencies*, and *Formal Logic*. Professor De Morgan was an extensive contributor to the *Penny Cyclopædia*, and to several leading periodicals of the time.

DE MORGAN, William Frend. Son of the preceding, born 16th Nov., 1839, died 13th Jan., 1917. He was educated at University College School and University College, and devoted many years to stained glass and ceramic work. He commenced his career as a writer of fiction in 1905, and wrote amongst other novels, *Joseph Vance* (1906), *Alice-for-Short* (1907), *Somehow Good* (1908), and *It Never Can Happen Again* (1909).

DEMOS'THENES (-nēz). The famous ancient Greek orator, was the son of a sword-cutler at Athens, where he was born in 382 (according to some in 385) B.C. His father left him a considerable fortune, of which his guardians attempted to defraud him. Demosthenes at the age of seventeen years, conducted a suit against them himself, and gained his cause. He then set himself to study eloquence, and though his lungs were weak, his articulation defective, and his gestures awkward, by perseverance he at length surpassed all other orators in power and grace.

He thundered against Philip of Macedon in his orations known as the *Philippics*, and endeavoured to instil into his fellow-citizens the hatred which animated his own bosom. He laboured to get all the Greeks to combine against the encroachments of Philip, but their want of patriotism and Macedonian gold frustrated his efforts. He was present at the battle of Chæroneia (380 B.C.), in which the Athenians and Bœotians were defeated by Philip, and Greek liberty crushed. On the accession of Alexander in 336 Demosthenes tried to stir up a general rising against the Macedonians, but Alexander at once adopted measures of extreme severity, and Athens sued for mercy. It was with difficulty that Demosthenes escaped being delivered up to the conqueror.

In 324 he was imprisoned on a false charge of having received a bribe from one of Alexander's generals, but managed to escape into exile. On the death of Alexander next year he was recalled, but the defeat of the Greeks by Antipater caused him to seek refuge in the temple of Poseidon, in the Island of Calauria, on the coast of Greece, where he poisoned himself to escape from the emissaries of Antipater (322 B.C.).

Demosthenes is by most modern scholars considered to represent the acme of Attic eloquence. His fame as an orator is equal to that of Homer as a poet. Cicero pronounces him to be the most perfect of all orators. He carried Greek prose to a degree of perfection which it never before had reached. Everything in his speeches is natural, vigorous, concise, symmetrical. We have under his name sixty-one orations, some of which are not genuine. The great opponent —and indeed enemy—of Demosthenes as an orator was Æschines.—BIBLIOGRAPHY: S. H. Butcher, *Introduction to the Study of Demosthenes*; Sir R. C. Jebb, *The Attic Orators from Antiphon to Isaeus*; W. C. Wright, *A Short History of Greek Literature*.

DEMOT'IC, or ENCHORIAL (of or belonging to the people), **ALPHABET.** A simplification of the hieratic, which again was a contraction of the hieroglyphic characters. *See* HIEROGLYPHIC WRITING.

DEMOT'ICA, or DIMOTIKA. A town in Thrace, Balkan Peninsula, on the right bank of the Maritza, 20 miles S. of Edirne; the see of a Greek archbishop; pop. about 8000.

DEMPSEY, Jack. Irish-American pugilist. Born in 1895 his real name is Wm. Harrison. He was a lumber jack before taking up pugilism and came into prominence when he defeated the world's heavy-weight champion, Jess Willard, at Toledo in 1915. He remained champion until 1926, when he was beaten by Gene Tunney. After his defeat by Tunney Dempsey became a film actor.

DEMPSTER, Thomas. A learned Scotsman, born in Aberdeenshire, 1579, died at Bologna 1625. He was educated at Aberdeen and Cambridge, went to France at an early period of life, and became a professor in the Collège de Beauvais. He ultimately held professors' chairs at Nimes, Pisa, and at Bologna, where he died. His works are very numerous. Among them his *Historia Ecclesiastica Gentis Scotorum* is the most remarkable, though, instead of being, as its title would indicate, an ecclesiastical history of Scotland, it is merely a list of Scottish authors and Scottish saints, many of whom are fictitious. His most valuable work is *De Etruria Regali*.

DEMUL'CENTS (Lat. *demulcere*, to stroke down, soften). Colloid substances used in medicine on account of their cohesive properties, whereby they serve to protect mechanically any surface.

DEMURR'AGE (Lat. *demorari*, to delay). In maritime law, the time during which a vessel is detained by the freighter, beyond that originally stipulated, in loading or unloading. When a vessel is thus detained she is said to be *on demurrage*.

The name is also given to the compensation which the freighter has to pay for such delay or detention. Demurrage must be paid though it be proved the delay is inevitable; but it cannot be claimed where it arises from detention by an enemy, tempestuous weather, or through the fault of the owner, captain, or crew. The term is applied also to detention of railway wagons.

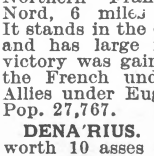
DEMURRER. In law, a stop at some point in the pleadings, and a

resting of the decision of the cause on that point; an issue on matter of law. A demurrer confessed the fact or facts to be true, but denied the sufficiency of the facts in point of law to support the claim or defence. The demurrer has been abolished in England, and other proceedings, designed to accomplish similar results, substituted in the High Court.

DEMY'. A size of paper intervening between royal and crown. Printing demy measures generally 22½ inches by 17½; writing, 20 inches by 15½; drawing, 22 inches by 17.

DENAIN (dè-nan). A town of Northern France, department of Nord, 6 miles from Valenciennes. It stands in the centre of a coal-field, and has large ironworks. A great victory was gained there in 1712 by the French under Villars over the Allies under Eugène and Albemarle. Pop. 27,767.

DENA'RIUS. A Roman silver coin worth 10 asses or 10 lb. of copper originally, and afterwards considered equal to 16 asses, when the weight



Denarius of Tiberius Cæsar

of the as was reduced to an ounce on account of the scarcity of silver. The *denarius* was equivalent to about 7½*d*. English money. There was also a gold denarius equal in value to 25 silver ones.

DENATURATION. The adulteration of a substance, thus rendering it unfit for human consumption. Alcohol is denatured by adding small quantities of paraffin, magenta, or wood-spirit.

DENBIGH (den'bi), or **DENBIGHSHIRE.** A county of North Wales, on the Irish Sea; area, 427,977 acres, of which about a fourth is arable. Along the N. the ground is level, in the E. hilly, while the mountains in the S. and W. rise from 1000 to 2500 feet.

There are several beautiful and fertile vales, amongst the more celebrated of which are the Vales of Llangollen, Clwyd, and Conway. Barley, oats, and potatoes are grown on the uplands; and in the rich valleys wheat, beans, and pease. Cattle and sheep are reared, and dairy husbandry is carried on to a considerable extent. The minerals consist of lead, iron, coal, freestone, slate, and mill-stone. Flannels, coarse cloths, and stockings are manufactured. The principal rivers are the Clwyd, the Dee, and the Conway. For parliamentary purposes it is divided into two divisions, one member for each. Pop. (1931), 157,645.

Denbigh, county town of Denbighshire, municipal borough near the centre of the Vale of Clwyd, 25 miles W. of Chester, picturesquely situated on a rocky eminence, the summit of which is crowned by the ruins of an ancient castle.

Charles I. found shelter in Denbigh after the battle of Rowton Moor. Tanning and shoemaking are carried on. It gives its name to a parliamentary division of the county. Pop. (1931), 7249.

DEN'DERA (the *Tentyra* of the Greeks and Romans). An Arab village of Upper Egypt, on the left bank of the Nile, 28 miles N. of Thebes, celebrated for its temple dedicated to Athor, the Egyptian Venus, the best preserved of any of the great temples of antiquity in Egypt.

DENDERMON'DE, or **TERMONDE.** A town, Belgium, province of East Flanders, at the confluence of the Dender with the Scheldt, 12 miles N.W. of Brussels. It is strongly fortified, defended by a citadel, and surrounded by low marshy ground which can be laid under water. Manufactures: woollens, linens, and tobacco. The town was taken by Marlborough in 1706. Pop. 10,193.

DEN'DRITE. A mineral aggregate resembling shrubs, trees, or mosses, usually on the surface of a joint-plane in a rock. The appearance is due to arborescent crystallization, resembling the frost-work on our windows. Most dentrites consist of hydrous manganese oxides.

DENDRO'BIUM. An extensive genus of epiphytes dispersed over the damp tropical forests of Asia, ord. Orchidaceæ. They vary much in habit; many are cultivated in hothouses on account of the beauty of their flowers.

DENE-HOLE. Ancient excavation, chiefly found in Essex and Kent, south-east England. At Grays, Essex, scores of them lie closely together. They are bell-shaped chambers, sometimes with apses in threes, and are reached by vertical shafts, 3 ft. across, sunk through the sand for a distance up to 60 ft. The chambers were from 16 to 20 ft. high. Sometimes utilized subsequently for refuges, the Britons perhaps sank them as silos for storing wheat.

DENGUE, or **DANDY FEVER.** An cute infectious disease confined to ropical and sub-tropical regions. It s characterized by very high fever, ntense pain in the joints and muscles, nd accompanied by a rash somewhat ike that of measles. The fever subides after three or four days, to be ollowed usually by a second paroxysm vith a return of the symptoms. Con-alescence is often very slow, and the ains may persist for weeks, causing stiff and stilted gait. The disease is ery seldom fatal.

DEN'HAM, Dixon, Lieutenant-olonel. African traveller, was born t London in 1786, died at Sierra eone 1828. In 1823–24 he was en-raged, in company with Captain Clap-erton and Dr. Oudney, in exploring he central regions of Africa. Den-am himself explored the region round Lake Tchad, was wounded nd separated from his company, but found his way home after great suffer-ng, when he published his *Narrative of Travels.* In 1826 he went to Sierra Leone as superintendent of the liber-ated Africans, and in 1828 was ap-pointed Lieutenant-Governor of the colony, but died of fever five weeks after his appointment.

DENHAM, Sir John. A poet, born at Dublin in 1615, died 1669, and was buried in Westminster Abbey. In 1641 he first became known by his tragedy of *The Sophy,* and in 1642 he published the first edition of his most celebrated poem, called *Cooper's Hill.* In 1651 appeared his prose tract against gambling (*The Anatomy of Play*). He was subsequently entrusted with several confidential missions by the Royalist party, and, being detected, fled to France. At the Restoration in 1660 he obtained the office of surveyor of the king's buildings, and was created a Knight of the Bath, and a fellow of the newly formed Royal Society.

DENIA. A seaport of Southern Spain, Valencia, in the province and 45 miles to the north-east of Alicante, with a large trade in raisins, grapes, and other fruit. Pop. 13,160.

DENIKIN, Anton Ivanovitsh. Russian soldier, born in 1872. Having served in the Russo-Japanese War, he was promoted general during the European War, and after the revolution of March, 1917, became chief of General Alexeiev's staff. He was in command of the South-Western armies during Kerensky's short term of office, but refused to serve under Lenin. He retired to Rostov-on-the-Don, where he formed, together with Alexeiev, a voluntary army, with a view to fighting against and overthrowing the Bolshevik regime and the power of Lenin and Trotsky. Denikin assumed the command over these counter-revolutionary forces in Oct., 1918, and for a time fought valiantly and successfully against the red armies of the Bolshevik Government. Soon, however, he suffered defeat after defeat, and early in 1920 he was completely beaten and escaped to England.

DENI'NA, Carlo Giovanni Maria. An Italian historian, born in 1731 at Revello, in Piedmont, died in 1813. He became professor at Pinerolo, and afterwards at Turin, where he published the first three volumes of his *History of Italian Revolutions* (1769), containing a general history of Italy. In 1777 he went to Rome, and four years later to Berlin, where he was welcomed by Frederick the Great, an account of whose life and reign he afterwards wrote. Most of his works —*History of Piedmont* and *Political and Literary History of Greece*—were written at Berlin. In 1804 he was introduced to Napoleon, who appointed him imperial librarian at Paris.

DENIS (Lat. *Dionysius*), **St.** The apostle of the Gauls. He set out from Rome on his sacred mission towards the middle of the third century, became the first Bishop of Paris, and was put to death by the Roman Governor Pescennius. Catulla, a heathen lady converted by the sight of the saint's piety and sufferings, had his body buried in her garden, where the abbey of St. Denis, founded by King Dagobert in A.D. 636, now stands. His feast is kept on 9th Oct.

DENIS, St. A town in France, department of the Seine, 6 miles north of Paris, lying within the lines of forts surrounding the capital. It contains the famous abbey church of St. Denis, a noble Gothic structure in part dating from the eleventh century or earlier, but much has been done in the way of restoration in recent times.

St. Denis was the burial-place of the Kings of France; and all her rulers from Hugh Capet downwards, besides some of the earlier dynasties, lay there till 1793, when the revolutionary fury of the Convention caused the tombs to be rifled and the church to be denuded. At the Restoration Louis XVIII. again sought out the relics of his ancestors as far as they could be found, and had them buried here, and there is now again a long series of restored royal tombs, with numerous other monuments, much stained glass, and modern decoration. The church is about 354 feet long and 92 feet high. The town has tanneries, breweries, and manufactories of

calicoes, gelatine, and soda. Pop. (1931), 82,412.

DEN'IZEN. In English law, an alien who is made a subject by the sovereign's letters patent, holding a middle state between an alien and a natural born or naturalized subject. He is distinguished from the latter, whose rights are granted by Parliament and are retroactive. A denizen cannot sit in either House of Parliament or hold any civil or military office of trust. *See* NATURALIZATION.

DENMAN, Lord. English lawyer. Born in London, July 23, 1779, Thomas Denman was educated at Eton and S. John's College, Cambridge. In 1806 he became a barrister and made a reputation by defending Queen Caroline in 1820. In 1830 Denman was made Attorney-General and in 1832 Lord Chief Justice. He died Sept. 22, 1854.

Denman's title, created in 1834, came in 1894 to a great-grandson, another Thomas Denman. He, the 4th baron, married a daughter of Viscount Cowdray and was Governor-General of Australia, 1911–14.

DENMARK. A kingdom of Northern Europe, consisting of the peninsula of Jutland, the district of Nord Slesvig (South Jutland Provinces), which became Danish by a plebiscite taken in 1920, the Faeroe Islands, and the great archipelago lying east of Jutland and consisting of the islands of Zealand, Fünen, Laaland, Falster, Bornholm, and many others. Greenland is the only Danish colony—the West Indian islands were sold to the U.S.A. in 1916, and Iceland is an independent sovereign state united to Denmark only through the identity of the king. The area is 16,576 sq. miles (Jutland, 11,412; Baltic Islands, 5136; Copenhagen, 28), and the population in 1930 was 3,550,656 (Jutland, 1,623,362; Baltic Islands, 1,310,225; Copenhagen, 617,069). The Faeroe Islands have an area of 540 sq. miles and a pop. (1930) of 24,200; while Greenland has an area of 46,740 sq. miles and a pop. (1930) of 16,630. Copenhagen is the capital; other chief towns are Odense, Aarhuus, Aalborg, Randers, and Horsens. For administrative purposes Denmark is divided into eighteen provinces or districts, besides the capital.

On the south Denmark is bounded by Germany and the Baltic; on the west it is washed by the North Sea; northward it is separated from Norway by the Skagerrack; eastward it is separated from Sweden by the Kattegat and the Sound. Denmark, whether insular or mainland, is a very low-lying country, the eastern side of Jutland, where the highest elevation occurs, not exceeding 5[illegible] feet.

Geology.—All the rocks belong [illegible] the upper series of the secondary [illegible] to the tertiary formation. The ro[illegible] most fully developed is chalk, abo[illegible] which is an extensive boulder form[illegible] tion containing seams of lignit[illegible] Above this are thick beds of clay a[illegible] marl. Where this prevails, as [illegible] Zealand and the east of Jutland, t[illegible] soil is generally fertile; but where [illegible] is overlaid with deep beds of san[illegible] as in the north and west of Jutlan[illegible] the aspect is extremely desolat[illegible] Nearly the whole west coast, indee[illegible] is rendered almost uninhabitable b[illegible] the drift-sand which has formed a[illegible] almost uninterrupted line of steril[illegible] downs called *Klitten*, extending fro[illegible] Cape Skagen (or The Skaw) to Blaa[illegible] ands Hook.

Physical Features.—A large portio[illegible] of Jutland consists of heathy o[illegible] moory land, comparatively unprofit[illegible] able. Elsewhere it exhibits a fertil[illegible] undulating surface. The islands[illegible] especially Zealand and Fünen, ar[illegible] fertile and present many landscap[illegible] beauties. The country was onc[illegible] covered with great forests, but thes[illegible] have disappeared, and Denmark i[illegible] largely dependent on other countrie[illegible] for her supplies of timber. Wood[illegible] of some extent still exist, however[illegible] especially in the islands. In earlies[illegible] prehistoric times (the Stone Age) th[illegible] Scotch fir was the prevailing tree, an[illegible] subsequently the oak. The principa[illegible] tree now is the beech, the oak forming[illegible] but a small portion of the timber o[illegible] Denmark. The elm, ash, willow[illegible] aspen, and birch are met with in[illegible] small numbers or singly. Pine forest[illegible] have been planted in the north o[illegible] Jutland and elsewhere.

Denmark has numerous streams[illegible] but no large rivers; the principal is the Guden, which flows north-east through Jutland into the Kattegat. It is navigable for part of its course. Less important streams are the Holm, the Lonborg, and the Stor Aa. All the others are insignificant brooks and streamlets. The lakes are very numerous but not large, none exceeding 5½ miles in length by about 1½ miles broad.

There are numerous winding inlets of the sea that penetrate far into the land. The largest of these, the Lim Fiord in Jutland, entering from the Kattegat by a narrow channel, winds its way through to the North Sea, thus making northern Jutland really an island. In this fiord, which widens out greatly in the interior and gives off various minor fiords, there are one large and various small islands.

Communication.—Intercourse between the various islands and parts

f the kingdom, separated from each ther by water, is well kept up by erries, and the country is well sup- lied with railways both in Jutland nd the islands. Copenhagen, Aal- org, Aarhuus, and Randers are the hief seaports.

Climate.—Owing to the lowness of he land and its proximity to the sea n all sides, the climate is remarkably emperate for so northerly a region, hough the thermometer in winter nay sink to 22° below zero, and in ummer rise to 89°. Violent winds re frequent, and rains and fogs pre- alent, but the climate is favourable o vegetation.

Agriculture.—The agricultural land s greatly subdivided, as the law inter- licts the union of small farms into arger. The total area under cultiva- ion (1931) was 7,872,000 acres, and about 38 per cent. of the whole popu- lation live by agriculture. Among crops the greatest area is occupied by oats, which are grown all over the country, but are best in Jutland. Barley is grown chiefly in Zealand, and is largely used in brewing beer, the common beverage of the country. Rye is extensively raised, and the greater part of the bread used in Denmark is made from it. Turnips, beans, pease, flax, hemp, hops, and tobacco also grown; but in general cattle-breeding, grazing, and the dairy take up most of the farmer's attention in Denmark. The old Danish breed of horses, found chiefly in Jutland, has long been famous for strength, symmetry, docility, and bottom. The fisheries are still important, but not so much so as formerly. The herring, turbot, torsk, and salmon are the most abundant. The manufactures, although progressing, are not yet of great importance. They include paper, gloves, woollens, cottons, earthenware, dairy machinery and metal goods generally, and artificial manures; and there are iron-foundries, sugar-refineries, shipyards, some extensive tanneries, margarine factories, and many distilleries. The country people of Denmark bake their own bread, brew their own beer, and make the greater part of their house furniture and utensils.

Commerce.—The commerce of Denmark is carried on chiefly with Great Britain, Germany, Norway, Sweden, and the U.S.A., Great Britain possessing the largest share and Germany coming a little behind her. The value of imports in 1911 amounted to £44,182,666, that of the exports to £48,191,444; in 1932 they amounted to £95,100,000 and £83,600,000 respectively. The chief imports are textile manufactures, metal goods, coal, timber, oil, coffee, sugar, tobacco, and fruit. The chief exports are butter (the most important item), cattle, horses, and swine, bacon, grain, hides, eggs, and other edibles. Much of the butter and other agricultural produce goes to Britain. The Danish mercantile marine in 1932 had a total tonnage of 1,176,034 registered tons. The railways have a length of about 3286 miles (1559 State owned). Since 1875 the unit of the Danish monetary system has been the *krone*, or crown, equal to 1*s.* 1½*d.*, or $\frac{1}{5}$th of a pound sterling. The krone is divided into 100 *öre*. The Danish *pound* weight is equal to 1·102 lb. avoirdupois. The *barrel* or *toende*, the principal measure in Denmark, is equal to 3·8 imperial bushels. The *foot* equals 12·356 English inches; the *mile* is 4·684 English miles. The metric system is now compulsory.

People.—The population of Denmark is composed almost exclusively of Danes, with a few thousand Jews and others. The Danes have regular features, fair or brownish hair, and blue eyes. They still maintain their reputation for seafaring skill and hospitable customs. They are almost exclusively Lutherans in religion, but unlimited toleration is extended to all faiths.

Education.—At the head of the educational institutions stand the University of Copenhagen (founded in 1479), the University of Aarhus (founded in 1928), and the Holberg Academy at Soröe. The provinces are well supplied with gymnasia and middle schools, and compulsory primary instruction is given at the public expense in the parochial schools.

Constitution.—The government of Denmark was originally an elective monarchy. In 1661 it became a hereditary and absolute monarchy, and in 1849 a hereditary constitutional one. Under the Constitution of 1915 (as amended in 1920) the executive power is vested in the king acting through his ministers, the legislative in the Rigsdag or Diet, acting jointly with the sovereign. This assembly consists of two chambers, the *Landsting* or Upper House, the *Folketing* or Lower House. The former is a Senate of 75 members, indirectly elected on the proportional system for eight years. The members of the Folketing are 149 in number, also elected on the proportional system for four years. The Rigsdag meets every year on the first Tuesday in October, and all money bills must be submitted to the Lower House. Iceland has its own Constitution and administration, under a charter which was made in 1874, modified in 1903 and 1915, and amended in 1920 (the legislative power is vested in the *Althing*,

consisting of 42 members, 36 elected by popular suffrage, and 6 by proportional representation.

Army.—The army consists of all the able-bodied young men of the kingdom who have arrived at the age of twenty years. The time of service is eight years in the regular troops, and afterwards eight more in the reserve. Every corps has to drill for thirty to forty-five days every year. The army on a war footing has a total strength of about 105,000 men, but the peace establishment is only about 11,000, excluding the armed police.

Navy.—The navy was reconstituted in accordance with the National Defence Act (1922). It is purely for coast defence, and, though small, is very efficient. It specializes in submarines and aircraft.

History.—The oldest inhabitants of Denmark whom we find mentioned by name were the Cimbri, who dwelt in the peninsula of Jutland, the *Chersonesus Cimbrica* of the Romans. They first struck terror into the Romans by their incursion, with the Teutones, into the rich provinces of Gaul (113-101 B.C.). After this, led by the mysterious Odin, the Goths broke into Scandinavia, and appointed chiefs from their own nation over Denmark, Norway, and Sweden.

For a considerable time Denmark was divided into a number of small states, whose inhabitants lived mostly by piracy along the neighbouring coasts. In A.D. 787 they began to make their descents on the eastern coasts of England, and along with other inhabitants of Scandinavia they conquered Normandy in 876-877.

Under Gorm the Old all the small Danish states were united in 920, and his grandson Sweyn, now the head of a powerful kingdom, commenced the conquest of Norway and of England, which was ultimately completed by his son Canute. Canute died in 1035, leaving a powerful kingdom to his successors, who in 1042 lost England, and in 1047 Norway. In 1047 Sweyn Magnus Estridsen ascended the throne, but with the exception of the great Waldemar the new dynasty furnished no worthy ruler, and the power of the kingdom decayed considerably till the accession of the politic Queen Margaret in 1387, who established the union of Calmar in 1397, uniting under her rule Denmark, Sweden, and Norway.

In 1448 Christian I., Count of Oldenburg, was elected to the throne, thus founding the royal family of Oldenburg, which kept possession of the throne till 1863. Under the rule of Christian, Norway, Sweden, Schleswig, and Holstein were connected with the crown of Denmark, but under his successor Christian II. Sweden established its independence. Under Frederick I. (1523-33) the Reformation was introduced. Christian IV. of Denmark ascended the throne in 1588, took part in the Thirty Years' War, and engaged twice in a war with Sweden, with most unfortunate results. Frederick III., again engaging in war with Sweden in 1657, was equally unsuccessful. Christian V. and Frederick IV. were defeated in the war with Charles XII. Denmark, however, after the fall of Charles XII., gained by the Peace of 1720 the toll on the Sound, and maintained possession of Schleswig. After this Denmark enjoyed a long repose.

In 1800, having acceded to the northern confederacy, the kingdom was involved in a war with Great Britain, in which the Danish fleet was defeated at Copenhagen 2nd April, 1801. In 1807, there being reason to think that Denmark would join the alliance with France, a British fleet was sent up the Sound to demand a defensive alliance or the surrender of the Danish fleet as a pledge of neutrality. Both were denied, till the Danish capital was bombarded and forced to capitulate, the whole fleet being delivered up to the British. The war, however, was continued, Denmark forming new alliances with Napoleon till 1814, when a peace was concluded by which she ceded Heligoland to England in exchange for the Danish West India Islands, and Norway to Sweden in exchange for Swedish Pomerania and Rügen, which, however, she shortly after surrendered to Prussia, receiving in return Lauenburg and a pecuniary compensation.

Schleswig-Holstein Dispute.—In June, 1815, the king entered into the German Confederacy as representing Holstein and Lauenburg. In 1848 Schleswig and Holstein revolted and were not finally subdued till 1852. In 1857 the Sound dues were abolished. Frederick VII. died in 1863 and with him the Oldenburg line became extinct. He was succeeded by Christian IX. (Prince of Sonderburg-Glücksburg).

At the commencement of 1864 the Danish territory was politically distributed into four parts, viz. Denmark Proper (consisting of the Danish islands and North Jutland), the Duchy of Schleswig or South Jutland, with a population more than one-half Danish, the remainder Frisian and German; the Duchy of Holstein, purely German; the Duchy of Lauenburg, also German.

The measures of the Danish Government compelling the use of the Danish language in state schools having given great umbrage to the German population of the duchies, the disputes resulted in the intervention of the German Confederation, and ultimately Holstein was occupied by the troops of Austria and Prussia (1864). After a short campaign the Prussians captured Alsen, overran the greater part of Jutland, and forced the Danes to accept a peace (1st Aug.) by which they renounced their right to the Duchies of Schleswig, Holstein, and Lauenburg.

A difference now arose between Austria and Prussia as to what should be done with the duchies, and Prussia showing an evident intention of annexing them, the result was a war, which ended in the total defeat of Austria at Sadowa (1866), the duchies thus passing over to Prussia. From this blow Denmark has recovered in a remarkable manner, and its wealth and commercial importance are now much greater than before, though the part it has played in European history has been unimportant.

Of late years the national defences have been greatly strengthened. In January, 1906, the king died (aged 88), and was succeeded by his eldest son as Frederick VIII. He died 14th May, 1912, while visiting Hamburg incognito, and was succeeded by his son Christian X., born 26th Sept., 1870. During the European War Denmark remained neutral. The question of Schleswig-Holstein was discussed at the Peace Conference at Paris, and as the result of a plebiscite Nord Slesvig was restored to Denmark in July, 1920. In the same year Denmark entered the League of Nations. In 1924 a socialist ministry came into power, and after the election of 1929 the socialists still formed the largest party in Parliament.

Language and Literature.—The Danish language belongs to the Scandinavian branch of the Teutonic family of languages, and is a sister of the Swedish and Norwegian. It is the most modern of the Scandinavian tongues; soft and rather monotonous, with shades of sound difficult for a foreigner to acquire. It is written either in the German or the Roman character. From the long union of Norway with Denmark, Danish became the written language of the Norwegians, and is still the language of the educated classes.

The oldest literary monuments of the Danish language consist of the laws of the early kings in the twelfth century. Next to these come the heroic ballads (*Kjämpeviser*), a large collection of about 500 epical and lyrical poems, some of which date from the thirteenth, others from the fourteenth, fifteenth, and sixteenth centuries. They were collected while they still lived in the mouths of the people by A. S. Vedel. Other ancient literary monuments, probably belonging to the thirteenth century, are the *Danish Rhyming Chronicle* and a Danish translation of the Old Testament.

During the Reformation period Christian Pedersen (1480-1554) did for the Danish language much what Luther did for the German, by publishing, besides other works, a translation of the New Testament, the *Psalter*, and the complete Bible.

The sixteenth and seventeenth centuries were distinguished by the publication of a number of works on the national history, among the principal writers of which are Hans Svaning the elder, Arild Hvitfeld, Nils Krag, Vitus Bering, and Ramus.

Modern Danish poetry commences in the period succeeding the Reformation with hymns, Scriptural dramas, and edifying narratives. Justesen Raach and Erik Pontoppidan the elders are amongst the chief names in this department.

Anders Bording (died 1677) and Thomas Kingo (died 1723) made names as lyric poets, the sacred poems of the latter being a noble contribution to Danish literature. A new epoch began with Louis Holberg (1684-1754), who was the founder of the Danish stage, and his name and that of the lyric and dramatic poet Ewald mark the brightest period of the national literature. Amongst the comic dramatists Peder Andreas Heiberg, and amonst song writers the celebrated Jens Baggesen hold the first place. Fresh life was inspired into Danish poetry by Adam Oehlenschläger (1779-1850), contemporary with whom was Adolf Wilhelm Schack Staffeldt (1770-1826), a lyric poet of the first rank. In 1811 Bernhard Severin Ingemann made his appearance, first as a lyric poet, but afterwards turned his attention to the drama, and later to historic romance.

Among dramatic writers the names of Johan Ludwig Heiberg, Overskou, Hostrup, Erik Bögh, and the more recent Molbech and Edvard Brandes are well known. Among poets we may mention Heiberg, Andersen, Blicher, Hölst, Paludan-Müller, and Rosenhoff; the modern school being represented by Carl Ploug, Drachmann, and Gjellerup. Among those who have displayed a talent for

novel-writing are Ch. Winther, Carl Bernhard, Meyer Aron Goldschmidt, and Sten Stensen Blicher, who describes common life in Jutland with poetic truth. Other distinguished Danish writers are Hendrik Hertz, a lyric poet and dramatist; Hans Christian Andersen, famous for his stories throughout Europe; and Waldemar Thisted, a lyrist and novel-writer of considerable note.

Amongst scholars the names of Madvig (1804-86), Westergaard (1815-78), Rask (1787-1832), Frederick Schouw (1783-1857), Solomon Dreier (1813-42), and others take a high place. One of the most subtle thinkers and philosophers of Scandinavia was Sören Aaby Kierkegaard (1813-55). Amongst modern Danish authors we must mention Jacobsen (1847-85), Drachmann (1846-1908), and the famous literary critic Georg Brandes.—BIBLIOGRAPHY: H. Weitemeyer, *Denmark: its History and Topography, Language, Literature, Fine Arts, Social Life, and Finance*; E. Gosse, *Two Visits to Denmark*; R. N. Bain, *Scandinavia*; F. E. Clarke, *The Charm of Scandinavia*; M. Thomas, *Denmark, Past and Present*; Shaw Desmond, *The Soul of Denmark*.

DENNEWITZ (den'e-vits). A small Prussian village in the circle of Potsdam, province of Brandenburg, famous for the battle between the French and Prussians, 6th Sept., 1813, in which the latter, aided towards the end by Russian and Swedish armies, were victorious.

DENNIS, John. An English dramatist and critic, born in London in 1657. A man of independent means, he devoted himself to literature, and wrote some dramatic pieces (*Liberty Asserted*) and poems, and at length settled down to criticism. His irritability and rancorous criticisms involved him in perpetual broils. Pope gave him a place in his *Dunciad*, and satirized him with merciless wit in his *Narrative of the Deplorable Frenzy of Mr. John Dennis*. Having fallen into poverty in his old age, a play was given for his benefit, to which his former antagonist, Pope, contributed a prologue. He died 6th Jan., 1734.

DENNSTÆDTINEÆ. A small family of Leptosporangiate ferns, section Gradatæ, intermediate between Dicksonia and Davallia. Principal genera, Dennstædtia and Microlepia.

DENNY. A town of Scotland, in Stirlingshire, on the south bank of the Carron, about 18 miles from Glasgow, having paper-mills, ironworks, and engine-works. Pop. (with Dunipace), 5512 (1931).

DENON (dè-nōn), **Dominique Vivant, Baron de.** A distinguished French artist, born 1747, died at Paris 1825. Of amiable manners, and with a talent for the arts, he was appointed gentleman-in-ordinary to Louis XV. He was afterwards employed in the diplomatic service, and was long connected with the French embassy in Naples, where he greatly improved his talent for drawing and engraving. Returning to France, he became acquainted with Bonaparte, accompanied him in his campaigns, was made Inspector-General of Museums, selected the works of art to be transferred from conquered countries to the Louvre, and superintended the erection of monuments in honour of the French successes. He published *Voyage dans la Basse et la Haute Égypte* (Paris, 1802), finely illustrated.

DEN'SITY. A body, whose mass per unit of volume is usually expressed in pounds per cubic foot, or grammes per cubic centimetre. Thus the density of water is 62½ lb. per cubic foot, or 1 gm. per cubic centimetre. Density is a property which serves to distinguish substances from one another. It varies within wide limits, the rare metal osmium being 250,000 times as dense as hydrogen gas under normal conditions. In general, solids are denser than liquids, and liquids denser than gases, but there are many exceptions. For instance, the liquid mercury is denser than many solids, its density being 13·6 gm. per cubic centimetre, whereas the now widely employed metal aluminium has a density of 2·7. In physics, the densities of substances are sometimes referred to that of water at 4° C. as a standard. The number thus obtained is called the relative density or specific gravity of the substance. Water has maximum density when at 4° C. or 30° F.

DENTAL FORMULA. An arrangement of symbols and numbers used to signify the number and kinds of teeth of a mammiferous animal. The *dental formula* of man is:

$$\text{I.}\ \tfrac{2-2}{2-2},\ \text{C.}\ \tfrac{1-1}{1-1},\ \text{P.M.}\ \tfrac{2-2}{2-2},\ \text{M.}\ \tfrac{3-3}{3-3} = 32.$$

which is read thus: Two incisors on each side of both jaws, one canine tooth on each side of both jaws, two præmolars on each side of both jaws, and three true molars on each side of both jaws—in all, 32 teeth.

DENTA'LIUM, or TUSK-SHELL. A marine mollusc that with a few allied forms constitutes the small class Scaphopoda. It burrows in the sand by means of a three-lobed foot, and is covered by a curved tubular

shell open at both ends, and presenting a superficial resemblance to a small tusk or tooth.

DENTA'TUS, Manius Curius. An ancient Roman general of Sabine descent. In 290 B.C. he brought to a victorious termination the war with the Samnites, which had lasted for nearly fifty years. In 275 B.C. he defeated King Pyrrhus at Beneventum, for which he received a magnificent triumph. In 274 B.C. he was made consul for the third time, and conducted to a successful issue the last war with the southern Italians. He died about 270 B.C.

DEN'TEX. A genus of spiny-finned fishes of the family of the Sparidæ, or sea-breams. They have conical teeth, and those immediately in front are long and hooked inward. The *Dentex vulgāris*, common in the Mediterranean, sometimes attains the length of 3 feet. Its general appearance is not unlike the perch. It is esteemed as an article of food.

DEN'TIFRICE (Lat. *dens*, tooth, and *fricare*, to rub). A preparation for cleaning the teeth, of which there are various kinds in the form of tooth-powders, tooth-washes, or tooth-pastes. Cuttle-fish bone, finely-powdered chalk, and charcoal are common dentifrices. Rhatany, catechu, myrrh, and mastic are also often employed.

DEN'TILS. In architecture, the little cubes resembling teeth, into which the square member in the bed-moulding of an Ionic, Corinthian, or Composite cornice is divided.

DEN'TINE. The ivory tissue lying below the enamel and constituting the body of a tooth. It consists of an organic basis disposed in the form of extremely minute tubes and cells, and of earthy particles.

DEN'TISTRY. The art of cleaning and extracting teeth, of repairing them when diseased, and replacing them when necessary by artificial ones. There are two very distinct departments in dentistry, the one being *dental surgery*, the other what is known as *mechanical dentistry*.

Dental Surgery.—The first requires an extended medical knowledge on the part of the practitioner, as, for instance, a knowedge of diseases whose effects may reach the teeth, and of the connection between the welfare of the teeth and the general system, as well as ability to discern latent diseases of the mouth and calculate the effects of operations. The chief operations in this department are *scaling*, or removing the tartar which has accumulated on the teeth; *regulating*, the restoring of over-crowded and displaced teeth to their proper position; *stopping*, the filling up of the hollow of a decayed tooth, the affected parts having been removed, and thus preventing the progress of decay; *extracting*, a process requiring considerable muscular power and delicacy of manipulation.

Mechanical Dentistry.—The second department, mechanical dentistry, is concerned with the construction of artificial substitutes for lost teeth, and requires much mechanical science, it being a very delicate work to give artificial teeth a perfectly natural appearance in shape and colour. The actual construction of the teeth, however, has passed largely into the hands of the manufacturers, and the dentist has only the selecting, fitting, and fixing to do.

Until the middle of last century no special curriculum or collegiate certificate was obtainable by practitioners of dentistry in Britain, who thus held an anomalous and altogether unrecognized position in the medical profession. This was partially remedied in 1858, when the dental licence of the Royal College of Surgeons of England was established for such as chose to pass the required examination. In 1878 an Act was passed regulating the education and registration of dentists, by which a course of instruction in various branches of medicine and surgery with a corresponding examination has been made necessary for all who wish to be registered as dental practitioners. The Dentists Act of 1878 has not proved so satisfactory as was hoped, and a new Act is in immediate prospect (1920). In the United States the Baltimore College of Dental Surgery is the oldest, being chartered in 1839.—BIBLIOGRAPHY: L. and M. Greenbaum, *A Practical Treatise upon the General Practice of Dentistry*; E. C. Kirk, *Principles and Practice of Operative Dentistry*; Guerini, *A History of Dentistry*; J. Head, *Modern Dentistry*.

DENTITION. Arrangement of the teeth in vertebrate animals. Absent from birds, they are supplemented in reptiles and fishes by accessory teeth on the palate. Their conformation and number vary in different orders. In mammals, those in the foremost jawbones, usually one-rooted, are incisors; those in the jaw proper generally include on each side a long, pointed, one-rooted canine and several grinding teeth, usually with two or more roots, those being premolars and the hindmost molars. In most mammals the permanent teeth are preceded by a set called the "milk teeth."

DENTON. Market town and urban district of Lancashire. It is 5½ miles from Manchester, on the L.M.S. Rly. Hat-making is the main industry. Pop. (1931) 17,383.

Denton Park, near Otley in Yorkshire, was long the seat of the Fairfax family.

D'ENTRECASTEAUX (dăn-tr-kas-tō). A name of a group of islands belonging to British New Guinea, about 10 miles to the east of it, including Fergusson (500 sq. miles, Normanby, and Goodenough, with fine mountain scenery, boiling springs and other volcanic phenomena, and much fertile soil. The inhabitants are Papuans.

DENUDA'TION. In geology, the act of wearing away the surface of the earth by natural agents.

DEN'VER. A city in the United States, capital of the state of Colorado, on the right bank of the South Platte River, 15 miles E. of the Rocky Mountains. It is well built, having imposing public and other buildings, and is increasing with extraordinary rapidity, being the junction of eight important railway systems, and having various flourishing industries. The climate is peculiarly dry and salubrious. The town was founded in 1858. Pop. in 1910, 213,381; in 1930, 287,861.

DEOBUND, or **DEOBAND** (dā-o-band'). A town of India, Saháranpur district, United Provinces, an ancient place with manufactures of fine cloth. Pop. 19,500.

DE'ODAND (*Deo dandum*). A thing to be given or dedicated to God, an obsolete legal term for anything that had caused a person's death, all such chattels being forfeited by the old rule of the common law of England to the sovereign or lord of the manor. Its origin was attributed to the notion that where a man was suddenly cut off in his sins expiation ought to be made for the benefit of his soul; and, accordingly, the chattel which occasioned his death should be forfeited to the king, to be devoted by him to pious uses. Deodands were abolished in 1846, largely owing to the increase of accidents due to the introduction of locomotives.

DE'ODAR, DEODAR CEDAR, or **INDIAN CEDAR** (*Cedrus Deodāra*). A large and valuable Indian tree similar to the cedar of Lebanon, and by some considered only a variety. It is found in the Himalayas, and yields timber that is much used in Hindustan. It was introduced into Britain in 1831, and is now a common ornamental tree. *See* CEDAR.

DEODORI'ZERS. Chemical substances which have the power of destroying fetid effluvia. Most of the substances so employed are strong oxidizing agents. Chlorine, sodium hypochlorite solution, chloride of lime, and potassium permanganate are the most usual agents employed.

DEOGARH (dā-o-*gar'*). The name of two towns in India. (1) In Bengal, 170 miles N.W. of Calcutta, with a group of temples to which numerous pilgrims resort. Pop. 9200. (2) In Udaipur Rajputana. Pop. 6846.

DEOGIRI (dā'o-gi-ri). *See* DAULATABAD.

D'ÉON DE BEAUMONT (dā-on dė bō-mōn), **Charles Geneviève Louise Auguste André Timothée.** A notorious French character, chevalier, doctor of law, and diplomatist, born in 1728. In 1755 he was sent as envoy on a difficult mission to the Russian court, on which occasion he dressed himself as a woman. He afterwards distinguished himself in the Seven Years' War, then went to London as secretary of the French legation, and ultimately became Minister Plenipotentiary. Having quarrelled with the French Government, he lived fourteen years in London in a kind of banishment. During these years he had occasionally, probably for purposes of in-

Deodar

rigue, dressed and passed as a female, and about this time his sex began to be doubted. In 1777 he returned to France, was ordered to dress as a woman, and continued to do so both there and after he returned to England (in 1785), where he died in great poverty in 1810, being then regarded by everyone as a female. A post-mortem examination, however, proved beyond doubt that D'Éon was a male.—Cf. Andrew Lang, *Historical Mysteries*.

DEONTOL'OGY. The science of duty and its principles as distinct from those of prudence and interest. The term is used by certain philosophic schools (Bentham, Spencer, etc.) to denote their doctrine of ethics, and to distinguish between the science of mere custom and the science of obligation.

DEPART'MENT. The name given to the principal territorial divisions of France. At the time of the French Revolution departments replaced the old division into provinces, the change being voted in the Constituent Assembly in 1789. There are at present eighty-nine departments, including Corsica, and since 28th June, 1919, Bas Rhin, Haut Rhin, and Moselle, and excluding Algeria. Each of them is subdivided into arrondissements.

DE PAUW UNIVERSITY. At Greencastle, Putnam County, Indiana, one of the chief institutions of learning maintained by the Methodist Church in America, constituted in 1837, and known until 1884 as the Indiana Asbury University. It is excellently endowed, mainly by the liberality of the Hon. W. C. de Pauw, has a staff of 109 professors and teachers, and 1578 students.

DEPIL'ATORIES. Applications used to remove the hair from the body, especially the face and scalp, without injuring the texture of the skin. The celebrated *rusma* depilatory consists of quicklime and orpiment (arsenic trisulphide, boiled in water) impregnated with a strong alkaline lye. This mixture is rubbed gently on the parts, which are afterwards washed in warm water.

DEPORTATION. System of punishing criminals by transporting them to penal settlements outside the country they inhabit. The system is no longer practised in England, although undesirable aliens can be expelled. Criminals were at one time transported to Virginia, and later to Australia, but the practice was abolished in 1856. In France and certain other countries the system of deportation is still maintained for the worst type of criminals.

DEPOS'IT. In law, something given or entrusted to another as security for the performance of a contract, as a sum of money or a deed. In commerce, a deposit is generally either money received by banking or commercial companies with a view to employ it in their business, or documents, bonds, etc., lodged in security for loans. In the first case interest is usually paid to the depositor. The receipt given by the banker for money deposited with him is called a *deposit receipt*.

DEPOSIT. In geology, an aggregate formed by the settling down of mud, gravel, stones, organic remains, etc., which had been held in suspension or solution.

DEPOSITION. In law, the testimony given in court by a witness upon oath. It is also used to signify the attested written testimony of a witness by way of answer to interrogatories. Depositions are frequently taken conditionally, or *de bene esse*, as it is called; for instance, when the parties are sick, aged, or going abroad, depositions are taken, to be read in court in case of their death or departure before the trial comes on.

DEPOSITION OF A CLERGYMAN. The degradation of a clergyman from office, divesting him (in churches which do not, like the Church of Rome, hold the indelible nature of orders) of all clerical character.

DÉPÔT (dā'pō, or dep'ō). A French word in general use as a term for a place where goods are received and stored; hence, in military matters, a magazine where arms and ammunition are kept. The term is now usually applied to a military station situated in the centre of the recruiting district of a regiment, where recruits for this regiment are received and where they undergo preliminary training before joining their unit. In America it is the common term for a railway station.

DEPRECIATION. Term used to denote a fall in value. In particular it is applied to the percentage written off the book value of assets to reduce them to their market value. The Companies Act permits a company to pay dividends only out of profits, and to arrive at an accurate computation depreciation must be allowed for. Income-tax legislation allows certain deductions on account of depreciation from profit for tax purposes.

DEPRIVATION. The removing of a clergyman from his benefice on account of heresy or misconduct. It entails, of course, loss of all emolu-

ments, but not the loss of clerical character.

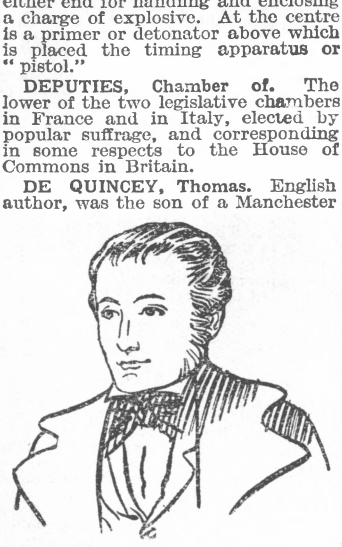
DE PROFUNDIS. In the liturgy of the Roman Catholic Church, one of the seven penitential psalms, the 130th of the Psalms of David, which in the Vulgate begins with these words, signifying "Out of the depths." It is sung when the bodies of the dead are committed to the grave.

DEPTFORD (det'ford). A parliamentary and municipal borough, England, in the counties of Kent and Surrey, on the right bank of the Thames, now forming part of London. It has some manufactures of pottery, chemicals, and soap. The old naval dockyard was shut up in 1869, but the royal victualling yard is still the largest of its kind. Deptford sends one member to Parliament. Pop. (1931), 106,886.

DEPTH CHARGE. Form of submarine mine first used in the Great War. It consists of a charge of explosive so arranged as to explode at a given depth. The mine consists of a steel case provided with rings at either end for handling and enclosing a charge of explosive. At the centre is a primer or detonator above which is placed the timing apparatus or "pistol."

DEPUTIES, Chamber of. The lower of the two legislative chambers in France and in Italy, elected by popular suffrage, and corresponding in some respects to the House of Commons in Britain.

DE QUINCEY, Thomas. English author, was the son of a Manchester



Thomas De Quincey

merchant, and born at Greenheys near Manchester, on 15th Aug., 1785, died at Edinburgh, 8th Dec., 1859. In 1793 his father died, leaving the family a fortune of £30,000. After attending some time the Bath and Manchester grammar schools, where he showed precocious ability, especially in classical studies, he importuned his guardian to send him to Oxford University, and on being refused he ran away from school, ultimately arriving in London in an absolutely destitute condition. His sufferings at this time he has described in his *Confessions of an English Opium Eater*. At length, in 1803, he matriculated at Oxford, and it was in the second year of his course here that he began to take opium in order to alleviate severe neuralgic pains.

On leaving college he settled at Grasmere, Westmorland, in the vicinity of Wordsworth and Southey, and devoted himself to literary work. Here or in London he remained till 1828, reading voraciously, and writing for the *London Magazine*, *Knight's Quarterly Magazine*, and *Blackwood's Magazine*. From 1828 to 1840 he lived in Edinburgh, then removed with his family to Lasswade, which continued to be his headquarters. His writings, nearly all contributions to magazines, are distinguished by power of expression, subtle thought, and an encyclopædic abundance of curious information.

His work belongs to that class of literature which he himself called "the literature of power," as distinguished from "the literature of knowledge." He was eccentric in his habits, incapable of managing money matters, but amiable and polite.—BIBLIOGRAPHY: A. H. Japp, *Thomas De Quincey: his Life and Writings*; H. S. Salt, *De Quincey*; J. Hogg, *De Quincey and His Friends*; Sir L. Stephen, *Hours in a Library*; Arvède Barine, *Poètes et Névrosés*.

DERA GHAZI KHAN. A district and town in the Punjab, India. The former, which is in Derajat division, has an area of 5606 sq. miles, and a population of 445,000. The town has a population of 20,731, half Hindus and half Mahommedans. It has extensive manufactures of silk, cotton, and coarse cutlery.

DERA ISMAIL KHAN. A town in India, in the North-West Frontier Province, several miles to the west of the Indus, which is here crossed by boat-bridges, or boats, connecting the town with the Indus Valley railway. Dera Ismail Khan is a staple place for cotton goods, has a cantonment, and carries on a trade with Afghanistan. It is well laid out, has several schools and a large bazaar. Pop. 39,341.

DERAJAT (-jät'). A commissionership of India, in the west of the Punjab, occupying part of the valley of the Indus. It is well watered and

rtile, and contains numerous towns ıd villages. Pop. 1,800,000, mostly ahommedans.

DERATING. Term used in Great ritain for the system of relieving roperty from rates. By the impor- ınt local Government Act of 1929, gricultural land was entirely relieved f rates and premises devoted to pro- uctive industry, including railways, om three-quarters of their rates. he loss to the local authorities is ade good from the national Ex- hequer.

DERBEND', or DERBENT'. A for- ified town in the Soviet State of)agestan, Russia, on the west shore of he Caspian, an ancient place formerly elonging to Persia. The manufac- ures consist of woollen stuffs, copper- nd iron-ware, and rose-water; and here is some trade in saffron, largely rown in the vicinity. Pop. 40,000.

DERBY, Edward Geoffrey Smith Stanley, fourteenth Earl of. An Eng- ish statesman, born at Knowsley 'ark, Lancashire, 29th March, 1799, lied there, 23rd Oct., 1869. In 1820 ıe was returned to the House of Commons as member for Stockbridge. At first inclining to the Whig party, ıe joined Canning's ministry in 1827, ınd in 1830 became Chief Secretary 'or Ireland in Lord Grey's Govern- nent, greatly distinguishing himself oy his speeches in favour of the Reform Bill in 1831-2. The opposi- tion led by O'Connell in the House of Commons was powerful and violent, but Stanley, while supporting a Bill for the reform of the Irish Church and the reduction of ecclesiastical taxation, was successful in totally defeating the agitation for the repeal of the Union. He warmly advocated the abolition of slavery, and passed the Act for this purpose in 1833; but in the following year a difference of opinion with his party as to the diver- sion of the surplus revenue of the Irish Church led him to join the Tories.

In 1841 he became Colonial Secre- tary under Sir Robert Peel, but resigned on Peel's motion for repeal of the corn laws. In 1851 and 1858 he formed ministries which held office only for a short period; and again in 1866, when his administra- tion signalized itself by the reform of the government in India, the conduct of the Abyssinian War, and the passing of a Bill for electoral reform (1867). Early in 1868, owing to fail- ing health, he resigned office, recom- mending Disraeli as his successor. Lord Derby joined to great ability as a statesman and brilliant oratorical powers a high degree of scholarly culture and literary ability. Among other works he published a successful translation of Homer's *Iliad* in 1864. —Cf. T. E. Kebbel, *English Statesmen since the Peace of* 1815 *: Derby.*

DERBY, Edward George Villiers Stanley, seventeenth Earl of. British politician, born in April, 1865. He served for some years in the Grenadier Guards, and entered the House of Commons in 1892. In 1895 he became a Lord of the Treasury, in 1900 Financial Secretary to the War Office, and in 1903 Postmaster-General. He succeeded to the earldom in 1908. Lord Derby became quite famous as the originator of the *Derby Scheme*, when he was Director-General of Recruiting in 1915. Under-Secretary for War in 1916, he succeeded Lloyd George as Secretary when the latter became Premier. In 1918 he was ap- pointed British Ambassador in Paris, but resigned his position in Sept., 1920. In the same year he was created G.C.B. In 1922, in Mr. Bonar Law's Cabinet, he again became Secretary for War, and this position he retained until 1924.

DERBY. A municipal, parliamen- tary, and county borough in England, capital of Derbyshire, on the Der- went, here crossed by a graceful bridge of three arches, 125¼ miles N.N.W. of London. It is pleasantly situated in a wide and fertile valley open to the south, and is well and regularly built in the modern quarter. It has some fine public buildings, amongst which are the churches of All Saints, St. Alkmund, and St. Werburgh, the county hall, school of arts, and infirmary. There is also a very handsome free library and museum.

Manufactures. The manufactures include silk, cotton, hosiery, laco, articles in Derbyshire spar, iron case- ings, and porcelain; and the princi- pal engineering works of the Midland Railway are here. Derby is one of the oldest towns in the kingdom, and is supposed to owe its origin to a Roman station, Derventio. Under the Danes it took the name of Deor- aby. Richardson, the novelist, and Herbert Spencer were natives. It returns two members to Parliament. Pop. 142,406 (1931).

The county of **Derby**, in the centre of the kingdom, is about 55 miles long and from 15 to 30 miles broad; area, 647,824 acres, five-sixths being arable or in permanent pasture. It exhibits much varied and romantic scenery, the southern and eastern parts having a fertile soil, while the north-western portion is bleak, with a rocky and irregular surface. Here is the loftiest range of the English Midlands, the mountains of the Peak. The Peak

itself is 2000 feet high. The principal rivers are the Derwent, the Trent, the Wye, the Erwash, the Dove, and the Rother. Oats and turnips are important crops, and dairy-husbandry is carried on to a large extent. Coal is abundant in various parts of the county, iron-ore is also plentiful, and lead, gypsum, zinc, fluor-spar, and other minerals are obtained. The manufactures are very considerable, especially of silk, cotton, and lace, machinery and agricultural implements. The county is divided into eight parliamentary divisions, each with one member. Pop. (1931), 757,332.—Cf. J. C. Cox, *Derbyshire*.

DERBY-DAY. The great annual London holiday, on which is run the horse-race for the stakes instituted by Lord Derby in 1780. It always takes place on a Wednesday, the second day of the race-meeting which falls at the end of May or beginning of June. The race is run on Epsom Downs, an extensive Surrey course 15 miles from London. The course is 1½ miles and the time usually about 2 minutes 42 seconds. The entry money of each subscriber is fifty guineas, and the stakes are run for by three-year-old colts and fillies entered when yearlings. In the first year of the Derby there were only thirty-six entries, but they are now very numerous, and the value of the winner's prize is at least £5000. The race is the most popular of British sporting events.

The Ascot races are patronized by royalty; the world of fashion is to be found at Goodwood; but Derby-day draws to Epsom a vast crowd of every class. During the European War the race was suspended, but a substitute was run at Newmarket from 1915 to 1918. In 1919 the Derby was again run at Epsom, and was won by Lord Glanely's *Grand Parade*. In 1920 it was won by Loder's *Spion Kop*, and in 1921 by Joel's *Humorist*.

DERBY SCHEME. A scheme produced by Lord Derby in 1915 with a view to making a final effort on behalf of voluntary recruiting. The National Register (q.v.), taken in August, 1915, of all persons between the ages of fifteen and sixty-five, had shown that over five million men of military age had not "joined up." As the number of recruits each week fell short of the number required by Lord Kitchener, Lord Derby, appointed Director of Recruiting, produced a scheme in which men were divided into 46 groups. Groups 1 to 23 were for single men, and groups 24 to 46 for married men. Thus a married man of eighteen was in group 24, whilst a single man of forty-one was in group 23. The scheme ensured that single men would be called up first, whilst men who had "attested" could appeal to a tribunal and claim temporary or permanent exemption. Two and a half millions offered themselves in consequence of the Derby Scheme, and two millions were accepted.

DEREHAM (dēr'am), **East.** A town in England, nearly in the centre of the county of Norfolk, with manufactures of agricultural implements, iron-foundries, and a brisk trade. The poet Cowper was buried in the church there, and George Borrow was born there. Pop. (1931), 5641.

DER'ELICT. A vessel or anything relinquished or abandoned at sea, but most commonly applied to a ship abandoned by the crew, and left floating about.

DERG, Lough. (1) A lake, Ireland, county of Donegal, about 3 miles long by 2½ miles broad at the broadest part, and studded with islets, one of which, called Station Island, is a great resort of Roman Catholic pilgrims; (2) an expansion of the River Shannon between County Tipperary and Counties Clare and Galway, about 24 miles long and averaging 2 miles in breadth.

DERHAM, William. English philosopher and divine, born in 1657, died 1735. He was long rector of Upminster, in Essex. In 1696 he published his *Artificial Clockmaker*. His best-known works are entitled *Physico - Theology*, *Astro - Theology*, and *Christo-Theology*.

DERMA, or DERMIS. Is the true skin lying under the epidermis (cuticle), which is known in contrast as the scarf-skin.

DERMATITIS. Inflammation of the skin. The term usefully comprehends all such affections, whatever their cause. Some types arise from local irritation, sunburn, frostbite, X-ray exposure, vegetable toxins such as poison ivy, animal parasites and ringworm fungi. **Blastomycetic dermatitis** is due to a yeast. **Occupational dermatitis**, arising from external irritants, such as tars and dyes, usually develops eczema-like forms.

DERMES'TES. A genus of beetles, one species of which (*D. lardarius*) is known by the name of bacon-beetle, and is often found in ill-kept ham or pork shops.

DERMOT MAC MURRAGH. The last Irish King of Leinster, attained the throne in 1140. Having carried off the wife of O'Ruarc, Prince of

Leitrim, he was attacked by the latter, and after a contest of some years driven out of Ireland (1167). He then did homage to the English king, and with the help of Richard, Earl of Pembroke, recovered his kingdom, but died in the same year (1170), and was succeeded by Pembroke, who had married his daughter.

DERNBURG, Bernhard. German financier and administrator, born in Darmstadt in 1865. His father was an editor of the *Berliner Tageblatt*. At the age of nineteen he came to New York to study banking methods, stayed there for several years, and on his return to Germany became director of a financial company. In 1906 he succeeded Prince von Hohenlohe Langenburg as Colonial Secretary. During his administration the condition of German colonies, and especially of German East Africa, was greatly improved. From 1914 to 1915 he was a zealous organizer of German propaganda in the United States, but was subsequently compelled to leave the country.

DÉROULEDE, Paul. French poet, politician, and agitator, born in Paris in 1846, died there in 1914. Called to the Bar in 1870, he served in the Franco-Prussian War, and afterwards carried on an active and passionate agitation for a war of revenge against Germany. He founded the Ligue des Patriotes, which was suppressed by the Government in 1889, was an ardent supporter of General Boulanger, and one of the leaders of the reactionary forces during the Dreyfus case. He sat in the Chamber of Deputies from 1893 to 1895 and from 1898 to 1899. In 1900 he plotted against the Republic, and sought to bring about a nationalist *coup d'état* with a view to overthrowing the parliamentary constitution. Found guilty, he was sentenced to ten years' exile, but was allowed to return in 1905, under the law of amnesty. His works include: *Chants de Soldat* (1872); *Nouveaux Chants de Soldat* (1875); *Chants du paysan* (1894); *Poésies Militaires* (1896); *La Moabite*, a religious drama (1880), forbidden by the Censor; and *L'Hetman*, a patriotic play (1877).

DERRICK. A simple kind of crane, chiefly used on board ship, consisting of a stout pole swung from a mast, and carrying hoisting-tackle at its upper end. The name is derived from that of a celebrated hangman.

DERRINGER. A small pocket pistol with a short barrel and a large calibre (usually ·41), very effective at short range. It is named after its inventor, a gun-smith in the United States of America, and would seem to have been first used in about 1859. It is a single-shot weapon, and so has largely been superseded by revolvers and automatic pistols.

DER'VISH, or DERVISE (Pers. "seeking doors" or beggar, and equivalent to the Ar. *fakir*). A Mahommedan devotee, distinguished by austerity of life and the observance of strict forms. There are many different orders of dervishes, the underlying idea of most of them being the revival and increase of the Moslem faith. Some live in monasteries, others lead an itinerant life, others devote themselves to menial or arduous occupations. They are respected by the common people, and the mendicants among them carry a wooden bowl into which the pious cast alms. One of their forms of devotion is dancing or whirling about, another is shouting or howling, uttering the name *Allah*, accompanied by violent motions of the body, till they work themselves into a frenzy and sometimes fall down foaming at the mouth. They are credited with miraculous powers, and are consulted for the interpretation of dreams and the cure of diseases. *See* MAHOMMEDANISM.—BIBLIOGRAPHY: E. W. Lane, *Modern Egyptians*; J. P. Brown, *The Dervishes, or Oriental Spiritualism*; S. M. Zwemer, *Arabia, the Cradle of Islam*.

DER'WENT. The name of four rivers in England, in Derbyshire, Yorkshire, Durham, and Cumberland respectively, the last draining Derwentwater Lake. Also a river in Tasmania.

DERWENTWATER, James Radcliffe, third and last Earl of. One of the leaders in the rebellion of 1715, born in London 28th June, 1689. The standard of revolt having been raised in Scotland, Lord Derwentwater commenced the movement in England on 6th Oct., 1715, but was forced, along with the other Jacobite nobles, to surrender at discretion on 13th of Nov. He was executed on Tower Hill 24th Feb., 1716, his estates being confiscated, and in 1735 granted to Greenwich Hospital.

DER'WENTWATER, or KESWICK LAKE. A beautiful lake in Cumberland, England, in the vale of Keswick. It is about 3 miles in length and 1½ miles in breadth, and stretches from Skiddaw on the north to the hills of Borrowdale. Near the south-east corner is the celebrated cascade of Lodore. Its waters are carried to the sea by the Derwent.

DERZHAVIN (der-zhä'vin), **Gabriel Romanovitsh.** A Russian lyric poet, born in 1743, died in 1816. He

entered the army as a private soldier, distinguished himself highly, and was eventually transferred to the Civil Service, in which he obtained the highest offices. In 1803 he retired from public life and devoted himself entirely to poetry. One of his most beautiful poems is *Oda Bog*, or *The Address to the Deity*.

DESAGUADERO (des-â-gwâ-dā'rō). A river of Bolivia, in a valley of the same name, issuing from Lake Titicaca, and carrying its waters into Lake Aullagas. Also a river in the Argentine Confederation flowing into Lake Bevedero Grande, and separating the provinces of San Juan and Mendoza. Desaguadero signifies in Spanish "a channel of outlet."

DESAIX DE VEYGOUX (dė-sā dė vā-gö), **Louis Charles Antoine.** A distinguished French general, born in 1768 at St. Hilaire d'Ayat, in Auvergne, died 1800. He was of noble family, and entered the army a sub-lieutenant. He distinguished himself greatly in 1794 under Pichegru, and two years later with the army of the Rhine under Moreau. In 1797 he accompanied Bonaparte to Egypt, and was very successful in reducing Upper Egypt. After the Treaty of El Arish he followed Bonaparte to Italy, took command of the corps of reserve, and, arriving on the field of Marengo at a critical moment, decided the victory by a brilliant charge, 14th June, 1800. He himself fell, mortally wounded by a musket bullet.

DESAULT (dė-sö), **Pierre Joseph.** One of the most celebrated surgeons of France, was born in 1744, and died in 1795. After some experience in the military hospital at Bélfort, he went to Paris in 1764, studied under Petit, and two years afterwards became a lecturer on his own account. His reputation soon increased, and he became principal surgeon in the Hospital de la Charité, and in 1788 was put at the head of the great Hôtel Dieu in Paris. Here he founded a surgical school, in which many of the most eminent surgeons of Europe were educated. A digest of his surgical works was published by Bichat in 1798 (*Œuvres chirurgicales de Desault*).

DES'CANT. In music, an addition of a part or parts to a subject or melody, a branch of musical composition which preceded the more modern counterpoint and harmony, coming into existence at the end of the eleventh or beginning of the twelfth century.

DESCARTES (dā-kärt), **René.** A great French philosopher and mathematician, with whom the modern or new philosophy is often considered as commencing. He was born 31st March, 1596, at La Haye, in Touraine, died 11th Feb., 1650. Educated at the Jesuit College of La Flèche, where he showed great talent, he entered the military profession and served in Holland and in Bavaria. In 1621 he left the army, and after a variety of travels finally settled in Holland, and devoted himself to philosophical inquiries. Descartes, seeing the errors and inconsistencies in which other philosophers had involved themselves, determined to build up a system anew for himself, divesting himself first of all of the beliefs he had acquired by education or otherwise, and resolving to accept as true only what could stand the test of reason. Proceeding in this way, he found (*Meditationes de Prima Philosophia*) that there was one thing that he could not doubt or divest himself of the belief of, and that was the existence of himself as a thinking being, and this ultimate certainty he expressed in the celebrated phrase "*Cogito, ergo sum*" (I think, therefore I am).

Here, then, he believed he had found the test of truth. Starting from this point Descartes found the same kind of certainty in such propositions as these: that the thinking being or soul differs from the body (whose existence consists in space and extension) by its simplicity and immateriality and by the freedom that pertains to it; that every perception of the soul is not distinct; that it is so far an imperfect finite being; that this imperfection of its own leads it to the idea of an absolutely perfect being; and from this last idea he deduces all further knowledge of truth. Descartes has been rightly called the father of modern philosophy, for in him the modern spirit came into existence. In an age of unrest and ferment his work was that of a great systematizer. He also contributed greatly to the advancement of mathematics and physics, the method of co-ordinates, which has reolutionized geometry, and is of fundamental importance in modern mathematical physics, being due to him.

His system of the universe attracted great attention in his time. One of his fundamental doctrines was that the universe is full of matter, there being no such thing as empty space. On this basis he developed the hypothesis of celestial *vortices*, immense currents of ethereal matter, by which he accounted for the motion of the planets (*Principia Philosophiæ*, 1664). His works effected a great

evolution in the principles and methods of philosophy. In 1647 the French court granted him a pension of 3000 livres, and two years later, on the invitation of Christina of Sweden, he went to Stockholm, where he died.—BIBLIOGRAPHY: Sir J. P. Mahaffy, *Descartes*; A. Fouillée, *Descartes*; E. Boutroux, *L'Imagination et les mathématiques selon Descartes*; N. Smith, *Studies in Cartesian Philosophy*; E. S. Haldane, *Descartes: his Life and Times.*

DESCENT'. In law, was the transmission by operation of law of the title to lands on the decease of the proprietor without will or other settlement. By the present law the term descent may be said to apply also to personal property. The principle determining to whom property belonged on the death of the owner was that of consanguinity, or relationship by blood, though with some exceptions, as in the case of the portion or the use of a portion of a man's property given by the law of England to his widow. Kindred in blood are (1) descendants, (2) ancestors, (3) collateral relatives, being those descended from a common ancestor with the deceased, e.g. cousins. Every person has two sets of ancestors, paternal and maternal, and therefore two sets of collateral relatives. Collateral kindred are of the whole blood or of the half-blood.

The rules in England governing the descent of lands belonging to persons who died intestate before 1st Jan., 1926, were very complicated. Descendants took precedence before any other relations. Males were always preferred to females in the same degree, and the eldest male to the younger male in the same degree. If the eldest son was dead his descendants represented him according to the same rule. The rule that descendants represented their ancestors was a general one applicable to males and females. If there were no descendants of the eldest son his next brother would inherit the lands; and then *his* descendants as before. If all the sons of the proprietor were dead without issue his daughters would inherit his land but in equal shares, and they were called "coparceners." If there was no descendant of the proprietor the nearest male paternal ancestor took the lands. The proprietor's wife would never be his heir unless by collateral relationship to him, but she might be entitled to a life interest in one-third of the land (which interest was called *dower*).

By the Administration of Estates Act, 1925, as from 1st Jan., 1926, all these old rules were repealed. Real and personal property now devolve according to the same rules. The whole estate of a person dying intestate is held by the personal representative of the deceased upon trust for sale with power to postpone the sale. In practice only part of the estate sufficient to pay death duties, debts, etc., is sold. The residue is then distributed as follows: (1) If the deceased leaves a husband or a wife such spouse takes (*a*) all moveable property absolutely, and (*b*) £1000 free of death duties with interest at 5 per cent per annum from the date of death of the deceased, (*c*) the income of the whole residue if the deceased left no issue or half if he did.

(2) Subject to these rights of the husband or wife the whole residue is held on trust for the children of the intestate on what are called the "statutory trusts" (the main object of these trusts being to provide an income for the children in equal shares). (3) If the deceased leaves no issue the residue goes to his father and mother in equal shares, or if only one of them survives then to that one absolutely.

(4) Failing issue or parents the residue is held on trust for the following persons if living at the date when the deceased died, in the following order: (*a*) the brothers and sisters of the whole blood of the deceased on the statutory trusts, (*b*) the brothers and sisters of the half-blood of the deceased on the statutory trusts, (*c*) the grandparents of the deceased in equal shares (if more than one is living), (*d*) the uncles and aunts of the whole blood of the deceased on the statutory trusts (first cousins of the deceased and their issue represent a deceased uncle or aunt), (*e*) the uncles and aunts of the half-blood of the deceased on the statutory trusts (issue of a deceased aunt or uncle of the half-blood represent their parent), (*f*) the husband or wife of the deceased absolutely.

If none of these relatives survives the deceased the whole residue goes to the Crown as *bona vacantia*, i.e. ownerless property.

DESCHANEL, Paul Eugène Louis. French statesman and tenth President of the French Republic, born at Brussels on 13th Feb., 1856, where his father was in exile for opposition to Napoleon III. Educated at the Collège Sainte Barbe and the Lycée Condorcet, Paris, he was private secretary first to De Marcère, the Home Secretary, in 1876, and then to the Premier, Jules Simon, in 1877. Sub-prefect at Dreux, Brest, and Meaux, he was elected to the Chamber

of Deputies in Oct., 1885, for Nogent le Rotrou. In the Chamber of Deputies he soon displayed his power of eloquence, and eventually became the leader of the Progressive Republicans and exponent of the separation of Church and State. His authority, which he owed not only to his eloquence but also to his great tact and correct and dignified conduct during debates, gradually increased in the Chamber of Deputies, and even his political enemies admired his courage and his superiority of intellect.

He was consequently elected Vice-President of the Chamber in 1896 and in 1897, and succeeded Henri Brisson as President of the Chamber in 1898, retaining his office till 1902, when M. Léon Bourgeois became President of the Chamber. Re-elected President of the Chamber in 1912, and withdrawing his candidature to the presidency of the Republic in favour of Poincaré in 1913, Deschanel retained his post until 1920, when he was elected President of the Republic, but had to resign owing to ill-health in the September of the same year. He died in 1922. He was elected to the Académie Française on 18th May, 1899, and his works include : *La Question du Tonkin* (1883). *La Politique Française en Océanie* (1884), *Orateurs et hommes d'Etat* (1888), *Figures des Femmes* (1889), *Figures Littérairs* (1889), *La Question Sociale* (1898), *Quatre ans de Présidence* (1902), *Politique Intérieure et étrangère* (1906), *Paroles Françaises* (1911), and *La France Victorieuse* (1919).

DESEADA (de-se-ä'dà), or **DÉSIRADE.** One of the Leeward Islands, belonging to the French (dependency of Guadeloupe), in the Caribbean Sea, about 10 miles long and hardly 5 miles broad. The soil is in some places black and good, in others sandy and unproductive. Area 10 sq. m., population about 1600.

DESERT. Region where, on account of intense cold or insufficient rain, forms of life and little, or no, vegetation can exist. Where the mean annual rainfall is less than 10 inches, desert conditions usually prevail. Deserts are characterised by intense heat, as in the Sahara, or by great cold, as in the Arctic and Antarctic wastes. Notable deserts are the Sahara and Kalahari in Africa, the Gobi in Asia, the Atacama in S. America, and some in Australia.

DESERTION. In law, the term applied to the act by which a man abandons his wife or a wife her husband. Such desertion without due cause is, in England, ground for a judicial separation. Property a wife may have acquired since desertion is protected against her husband, and he may be forced to provide for her maintenance. By Scottish law, where either the husband or wife has deserted and remained separate without due cause for four years, divorce may be obtained. In the military sense *desertion* is punishable under Section 12 of the Army Act. There are two degrees of desertion : (1) that committed on active service or when under orders for active service, punishable by death ; and (2) that committed under other circumstances, punishable by imprisonment or penal servitude.

DESHOULIÈRES (dā-söl-yār), **Antoinette du Ligier de Lagarde.** A French woman of much literary reputation in the seventeenth century, born 1638, died 1694. She wrote in the *Mercure Galant* under the name of Amaryllis, and Boileau has described her in his tenth *Satire*. Among her works are odes, eclogues, idyls, and a tragedy (*Genseric*).

DESICCATION. A process of dispelling moisture by the use of air, heat, or chemical agents such as chloride of calcium, quicklime, oil of vitriol, and fused carbonate of potash.—**Desiccation cracks,** in geology, are the fissures caused in clayey beds by the sun's heat, and seen in various rock strata.

DÉSIRADE. The official name of the West Indian island sometimes known as Deseada (q.v.).

DESMIDIA'CEÆ, or **DESMIDIEÆ.** A family of microscopic, fresh-water Green Algæ, group Conjugatæ. They are green gelatinous plants composed of variously formed cells having a bilateral symmetry, which are either free, or in linear series, or collected into bundles or into star-like groups, and embedded in a common gelatinous coat. Desmidiaceæ differ from Diatomaceæ in their green colour and absence of silica.

DESMO'DIUM. A large genus of leguminous plants, sub-ord. Papilionaceæ, natives of tropical and subtropical countries. *D. gyrans* is the telegraph plant, so called from the curious movements performed by the two small lateral leaflets of each leaf, which, at high temperatures, wave up and down like the arms of a semaphore.

DES MOINES (dé moin). A city of the United States, capital of the state of Iowa and of Polk County, on the Des Moines River, about 350 miles west of Chicago. Among its chief buildings are the new State house, the State arsenal, university, and opera-houses. There are coal-mines

in the vicinity, and the city is a great railway centre with manufactures of flour, machinery, etc. Pop. 142,559.

DES MOINES. The largest river in the state of Iowa, rises in the S.W. of Minnesota, and flows in a south-easterly direction till it falls into the Mississippi about 4 miles below Keokuk, after a course of 550 miles.

DESMONCUS. A genus of tropical American climbing palms, scrambling by means of stout hooks which are modified leaflets.

DESMOULINS (dā-mö-laṇ), **Benoit Camille.** Born in 1760, was conspicuous during the first period of the French Revolution. He was amongst the most notable of the pamphleteers and orators who urged the multitude forward in the path of revolution. He, along with others, prepared the plan for the taking of the Bastille (July, 1789), was one of the founders of the club of Cordeliers, and the promoter if the assembly in the Champ de Mars. In 1789 he began his career as a journalist by the issue of a weekly publication (*Les Révolutions de France et de Brabant*). In 1793 he gave his vote for the death of the king. Having become closely connected with Danton and the party of opposition to Robespierre, and inveighing against the reign of blood and terror, he was arrested on the order of the latter on 30th March, 1794, tried on the 2nd April, and executed on the 5th. He met his fate in an agony of despair.—Cf. F. A. Aulard, *Les Orateurs de la Législative et de la Convention.*

DESNA. A river in the Ukraine, which rises in the government of, and about 50 miles east of the town of Smolensk, flows through the governments of Orel and Tshernigov till it joins the Dnieper near Kiev. It is 550 miles in length and navigable nearly throughout.

DE SOTO, Hernando. A Spanish explorer and discoverer of the Mississippi, born about 1496, died in 1542. He accompanied expeditions to the New World under Davila and Pizarro, and played a distinguished part in the conquest of Peru. In 1536 he led an expedition to Florida, whence after many difficulties he penetrated to the Mississippi, where he was attacked with fever and died.—The name De Soto has been given to a county in the N.W. of Mississippi, and to several places in the United States.

DES'POT (Gr. *despotēs*). Originally a master, a lord; at a later period it became an honorary title which the Greek emperors gave to their sons and sons-in-law when governors of provinces. At present *despot* means an absolute ruler, and in a narrower sense a tyrannous one.

DESSALINES (dā-sà-lēn), **Jean Jacques.** Emperor of Hayti, born in Africa about 1760. He was a slave in 1791, when the insurrection of the blacks occurred in that island, but was set free along with the other slaves in St. Domingo in 1794. His talents for war, his courage, and unscrupulous conduct raised him to command in the insurrections of the coloured people, and after the deportation of Toussaint-L'Ouverture, and the subsequent evacuation of the island by the French, Dessalines was appointed Governor-General for life with absolute power; and the year following (1804) was declared Emperor with the title of Jacques I. But his rule was savage and oppressive, and both the troops and the people, sick of his atrocities, entered into a conspiracy against him, and on 17th Oct., 1806, he was slain by one of his soldiers.

DESSAU (des'ou). A town in Germany, capital of the free state of Anhalt, in a beautiful valley on the left bank of the Mulde, mostly well built, with fine squares and many handsome buildings. The manufactures consist of woollens, woollen yarn, carpets, machinery, and tobacco. The former ducal palace has a picture-gallery and interesting relics and antiquities. Pop. 71,289.

DE STENDHAL. *See* BEYLE, MARIE-HENRI.

DESTER'RO, now **FLORIANOPOLIS.** A seaport of Brazil, capital of the state of Santa-Catharina. The harbour is fortified. Exports are maize, rice, tobacco, and dairy produce. Pop. 46,000.

DESTROYER. Short name for torpedo boat destroyer, a warship evolved as an answer to the torpedo boat. In the British navy the first was launched in 1893. Their uses were extended, and during the Great War they acted as scouts and screens for the fleets of battleships and battle cruisers. In 1914 the largest British destroyer displaced 965 tons and steamed 32 knots. Larger ones were built and by the end of the war they displaced 1320 tons and steamed 34 knots. In 1932 the British navy had 132 destroyers and a further 23 were building. The largest of these were the A class, the largest of which carried four 4.7 in. guns. Destroyers are organised in flotillas of eight, each under a captain or commodore.

DESTRUCTORS, REFUSE. The apparatus or plant used in the cremation of house and factory refuse.

Formerly refuse from large towns and populous areas was either disposed of for manurial purposes or spread over waste land, where its presence, speedily became a nuisance. The consequent danger to the public health, coupled with the increasing difficulty and cost of its disposal, led to attempts being made to deal with it by more sanitary methods. The first attempts to cremate it in a closed furnace on a large scale, made in London in 1870, were not successful, primarily owing to the unscientific design of the furnace. In 1877, however, there was built in Manchester the forerunner of the modern destructor, to the designs of the late Mr. Alfred Fryer. This consisted of two simple cells, the primary feature of the design being "the charging of the refuse into the back of the furnace, and drawing out the resulting clinker from the front."

With certain modifications, this design is in general use at the present time. The basic principles underlying their scientific design may be summed up in the following points: (*a*) Charging at regular intervals, the refuse being dumped into a hopper, and fed into the back of the furnace as a charge, means being taken to prevent undue escape of gases. The moisture having evaporated, the material may then be raked forward on to the fire-bars, where combustion takes place. (*b*) To avoid nuisance, the resulting gases must be inodorous, which requires a temperature of about 2000° F. This is obtained by passing the products of combustion over the hottest portion of the fire, prior to their passage into the main flue. (*c*) Removal of the fine dust and particles in suspension in the flue gases by means of spiral chambers at the base of chimney.

(*d*) Provision of forced draught. A well-designed plant should show little, if any, suspended matter in the gases on emission from the chimney. Formerly no use was made of the heat generated, but modern installations now invariably have steam-raising plant incorporated in the design. This power is commonly used to generate electricity. Some portion may be utilized in crushing and screening the clinker, which is frequently used in making slab-paving, or ground fine and used as a substitute for sand in mortar.

The following data may be found of service: (*a*) 60 per cent of the average refuse is combustible. (*b*) The calorific value may be taken as being one-seventh that of good steam-coal. (*c*) 100 electrical units may be obtained from each ton of refuse consumed. (*d*) With forced draught, as much as 100 lb. of refuse has been burnt per square foot of grate area per hour. (*e*) 250 tons of refuse per annum per 1000 of population may be estimated for.—BIBLIOGRAPHY; W. H. Maxwell, *Removal and Disposal of Town Refuse*; Kempe, *Engineer's Year Book*.

DESTUTT DE TRACY, Antoine Louis Claude. French philosophical writer, born in 1754 of a family of Scottish extraction, died in 1836. As a philosopher he belonged to the Sensationalist school, and considered all our knowledge to be derived originally from sensation. He has been called the logician and metaphysician of the school of Condillac. Among his chief works are: *Idéologie* (1801), *Logique* (1805), and *Traité de la Volonté* (1815).

DETERMINANT. A mathematical expression which appears in the solution of a system of equations of the first degree.

The solution of the equations

$$\begin{aligned} a_1x + b_1y &= c_1, \\ a_2x + b_2y &= c_2, \end{aligned}$$

is given by

$$\begin{aligned} x(a_1b_2 - a_2b_1) &= c_1b_2 - c_2b_1, \\ y(a_1b_2 - a_2b_1) &= a_1c_2 - a_2c_1. \end{aligned}$$

Here x and y have the same coefficient $a_1b_2 - a_2b_1$. This is called a determinant of the second order, and is written

$$\begin{vmatrix} a_1, & b_1 \\ a_2, & b_2 \end{vmatrix}.$$

We may now write

$$x \begin{vmatrix} a_1, & b_1 \\ a_2, & b_2 \end{vmatrix} = \begin{vmatrix} c_1, & b_1 \\ c_2, & b_2 \end{vmatrix}.$$

Similarly with three equations,

$$\begin{aligned} a_1x + b_1y + c_1z &= d_1, \\ a_2x + b_2y + c_2z &= d_2, \\ a_3x + b_2y + c_3z &= d_3, \end{aligned}$$

we find

$$\begin{aligned} x\{a_1(b_2c_3 - b_3c_2) + a_2(b_3c_1 - b_1c_3) + \\ a_3(b_1c_2 - b_2c_1)\} \\ = d_1(b_2c_3 - b_3c_2) + d_2(b_3c_1 - b_1c_3) + \\ d_3(b_1c_2 - b_1c_2). \end{aligned}$$

The coefficient of x, and the right-hand member, are here determinants of the third order, and the result is written

$$x \begin{vmatrix} a_1, & b_1, & c_1 \\ a_2, & b_2, & c_2 \\ a_3, & b_3, & c_3 \end{vmatrix} = \begin{vmatrix} d_1, & b_1, & c_1 \\ d_2, & b_2, & c_2 \\ d_3, & b_3, & c_3 \end{vmatrix}.$$

When the coefficient of x is expanded fully, it consists of six terms,

half of them positive and half negative, each term being the product of three letters, one from each row and one from each column. Thus in every term, such as the leading term $a_1b_2c_3$, the three letters *a*, *b*, *c*, and the three suffixes 1, 2, 3, all occur once and once only. With regard to the signs, we note that if the letters *a*, *b*, *c* are always kept in this order, an interchange of two suffixes changes the sign. Thus, e.g. we may start from $+ a_1b_2c_3$, interchange the suffixes 2 and 3, and thus find $- a_1b_3c_2$. Again, if in the latter term $- a_1b_3c_2$ we interchange the suffixes 1 and 3, we find $+ a_3b_1c_2$. It is easy to verify that after any number of interchanges of this kind a particular term will always come up with the same sign.

Thus the interchange of two rows (and similarly of two columns) changes the sign of the determinant. It follows that if two rows (or two columns) are identical, the determinant is zero. It is now easy to define functions of n^2 letters, arranged in a square array of n rows and n columns, with similar properties to those observed above in the case of determinants of the third order. Determinants are very extensively used in higher algebra, coordinate geometry, and other branches of mathematics. *See also* ELIMINATION. — BIBLIOGRAPHY: C. Smith, *Algebra*; T. Muir, *Theory of Determinants*.

DETERMINANTS. In biology, the name applied by Weismann to hypothetical particles contained in the nuclei of germ-cells, which determine the existence and nature of the various parts of the body of the embryo. The theory of determinants is part of an elaborate attempt to explain the facts of heredity on a mechanical basis. Although it may serve as a working hypothesis, it is regarded with disfavour by many experts, and may be regarded as an elaboration of the "provisional theory of pangenesis" advanced by Darwin.

DETER'MINISM. A term employed by recent writers, especially since J. Stuart Mill, to denote a philosophical theory which holds that the will is not free, but is invincibly determined either—according to the older form of the theory—by a motive furnished by Providence, or—according to the modern form—by the aggregation of inherited qualities and tendencies. Biological determinism maintains that each of our voluntary acts finds its sufficient and complete cause in the physiological conditions of the organism. Psychological determinism ascribes efficiency to the psychical antecedents. Opposed to determinism is the doctrine of indeterminism or indifferentism. *See* FREE-WILL.

DET'INUE. In law, the form of action whereby a plaintiff seeks to recover a chattel personal unlawfully detained.

DET'MOLD. A town, Germany, capital of Lippe-Detmold, on the left bank of the Werra, 50 miles south-west of Hanover, with a new and an old palace (or castle), good public library, and museum. In the vicinity a colossal statue has been erected to the Hermann or Arminius who overthrew the Roman general Varus and his legions in a battle which was fought near this place. The Senner race of horses is bred near Detmold. Pop. 16,051.

DET'ONATING POWDERS. Certain chemical compounds which, on being exposed to heat or suddenly struck, explode with a loud report, owing to one or more of the constituent parts suddenly assuming the gaseous state. The chloride and iodide of nitrogen are very powerful detonating substances. Mercuric fulminate or fulminating mercury ($C_2HgN_2O_2$) explodes violently when forcibly struck or when heated to 180° F. It is used for making percussion caps, and in detonators for exploding guncotton and nitro-glycerin preparations. Silver fulminate ($C_2Ag_2N_2O_2$) explodes even more violently.

DETONATING TUBE. A species of eudiometer, being a stout glass tube used in chemical analysis for detonating gaseous bodies. It is generally graduated into centesimal parts, and perforated by two opposed wires for the purpose of passing an electric spark through the gases which are introduced into it, and which are confined within it over mercury and water.

DETROIT (de-troit'; Fr. *détroit*, a strait or channel). A flourishing port and city of the United States, the largest town in Michigan, situated on the Detroit River, connecting Lakes Erie and St. Clair. The site rises gradually from the river, and the city is generally well built. Among the chief edifices are the city hall, the house of correction, post office, and opera-house. Detroit has increased very rapidly, a fact which is due to its admirable position for trade, and to its connections with a region into which a constant tide of emigration is flowing. Among the industrial establishments are saw-mills, flour-mills, building-yards for ships and boats, foundries, tanneries, blast-furnaces, pork-packing establishments, tobacco and cigar manufactories, and locomotive works. The

harbour is one of the finest in the United States, and has a depth of water sufficient for the largest vessels. Detroit owes its origin to the French, who visited the site in 1648 and erected the Fort Pontchartrain in 1701. Pop. (1930), 1,568,662.

DETROIT RIVER, or **STRAIT OF ST. CLAIR.** A river or strait of North America which runs from Lake St. Clair to Lake Erie. It is 28 miles long, and of sufficient depth for the navigation of large vessels. It is about ½ mile wide opposite Detroit and enlarges as it descends.

DETTINGEN (det'ing-en). The name of several places in Germany, amongst which is a village of Bavaria, on the right bank of the Main, famous for the victory gained by the English and Austrians under George II. of England over the French in 1743.

DEUCA'LION. In Greek mythology, the son of Prometheus and father of Hellen, ancestor of the Hellenes. According to tradition he saved himself and his wife, Pyrrha, from a deluge which Zeus had sent upon the earth, by building a ship which rested upon Mount Parnassus. To repair the loss of mankind they were directed by an oracle to throw stones behind them; the stones thrown by Deucalion became men, those thrown by Pyrrha women.

DEUS EX MACHINÂ (mak'i-na; Lat., "a god out of the machine"). A phrase used to designate the resorting to supernatural causes to explain phenomena that one is not able to account for by natural means. The phrase is taken from the practice on the classical stage of introducing a god from above by means of some mechanical contrivance in order to effect a speedy *dénouement* of the plot.

DEUTERONOMY (Gr. *deuteronomion*, the second law). The name of the fifth book of the *Pentateuch* (q.v.). Until the seventeenth century it was believed to have been written by Moses, but now it is generally held to be a compilation, the bulk of it having been written in the reign of Manasseh, or according to other scholars in the reign of Josiah. At any rate the book was discovered or rediscovered while Josiah was king (2 Kings xxii.). It represents the latest phase in the development of the teaching of Moses. Its chief aim is to combat idolatry, and to concentrate the religious life of the country at Jerusalem. It has a lofty moral tone. Of one passage (vi. 4 and 5) Christ said: "On these two commandments hang all the law and the prophets," (Matt. xxii. 40), and all His answers to the Tempter in the Wilderness are taken from the book of Deuteronomy.

DEUTZ (doits). A town in Prussian Germany, on the right bank of the River Rhine, opposite the city of Cologne, with which it communicates by a bridge. It is strongly fortified as part of the defences of Cologne, in which it is now incorporated. There are some manufactories of porcelain and glass, also an iron-foundry and machine-works. Pop. 17,060.

DEUT'ZIA. A genus of plants, nat. ord. Saxifragaceæ, containing seven or eight species, all of which are interesting from the beauty of their flowers, some of them favourite garden and greenhouse plants. They are small shrubs indigenous to China and Japan, and Northern India.

DE VALERA, Eamon. Irish Republican, born at New York in 1883, his father being a Spaniard, and his

Eamon De Valera

mother an Irishwoman. Educated at the Royal University of Ireland, he early became known for his revolutionary activities. In 1917 he was elected president of the Gaelic League and was arrested as an agitator. Elected to Parliament in 1918, while he was in prison, he refused to take his seat. He was elected "President" of the so-called "Irish Republic" soon afterwards, and in Feb., 1919, escaped from prison and reached New York. He became President of the Executive Council and Minister for External Affairs in the Irish Free State in 1932.

DEVELOPER. Chemical substance used to develop the latent image

formed by the action of light upon silver salts in a film of sensitive emulsion. The process consists of the reduction to a metallic state of the silver salts which have been acted upon by the light. Examples of developers are pyrogallic acid, amidol and hydroquinone.

DEV'ENTER. An old town in Holland, province of Overyssel, 8 miles north from Zutphen, at the confluence of the Schipbeek and Yssel Its industries embrace carpets, cast-iron goods, printed cottons, hosiery, and a kind of cake called *Deventer Koek*. It has a large export trade in butter. Pop. 36,227.

DEV'ERON. A river of Scotland belonging to Aberdeenshire and Banffshire, 60 miles long. It flows into the Moray Firth at Banff.

DEVIATION OF THE COMPASS. The deflection of a ship's compass needle from the magnetic meridian, caused by adjacent iron. Hard iron is very retentive of a magnetic state, and is specially liable to become magnetized during a hammering process, as in the building of the ship. Soft iron easily receives or loses magnetism, and its magnetic state varies with every shifting of the ship's head. The effect of the former can be counteracted by magnets suitably placed near the compass, that of the latter by spheres of soft iron. The ship is swung, and the compass errors found in the various positions.

The effects of the several contributing causes can then be separated, and the nature of the correctors necessary inferred with considerable accuracy. When these have been provided, the small residual errors for different positions of the ship are determined, and a table is constructed from which the navigator may read the slight correction to apply to the indication of his compass in steering any desired course.

DEVICE'. A name common to all figures, ciphers, characters, rebuses, and mottoes which are adopted by a person or a family by way of badge or distinctive emblem, often a representation of some natural body, with a motto or sentence applied in a figurative sense.

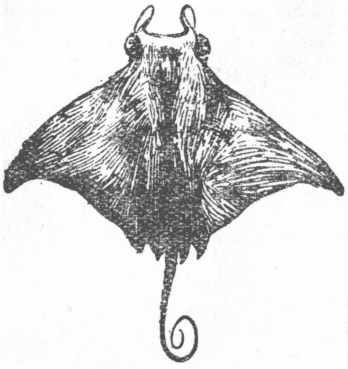
DEVIL (Gr., *diabolos*, a slanderer or accuser). In theology, the name given to a fallen angel, who is the instigator of evil, and the ruler of darkness. Most of the old religions of the East acknowledge a host of devils. The doctrine of Zoroaster, who adopted an evil principle called Ahriman, opposed to the good principle and served by several orders of inferior spirits, spread the belief in such spirits among the people. The Greek mythology did not distinguish with the same precision between good and bad spirits. With the Mohammedans *Eblis*, or the devil, was an archangel whom God employed to destroy a pre-Adamite race of *jinns*, or genii, and who was so filled with pride at his victory that he refused to obey God.

Satan. The Satan of the New Testament is also a rebel against God. He uses his intellect to entangle men in sin and to obtain power over them. But he is not an independent selfexistent principle like the evil principle of Zoroaster, but a creature subject to omnipotent control. The doctrine of Scripture on this subject soon became blended with numerous fictions of human imagination, with the various superstitions of different countries, and the mythology of the pagans. The excited imaginations of hermits in their lonely retreats, sunk as they were in ignorance and unable to account for natural appearances, frequently led them to suppose Satan visibly present; and innumerable stories were told of his appearance, and his attributes—the horns, the tail, the cloven foot—distinctly described.

Theology has always treated the devil from a psychological or ethical standpoint. From the New Testament we hardly learn more regarding the devil than that he has a distinct personality; that he is a spirit or angel who in some way fell; that he is devoid of truth and of all moral goodness, always warring against the soul of man and leading him towards evil; that he has demons, spirits, or angels under him who work his will, and enter into or "possess" men; but of his or their origin, original state, or fall, we really learn nothing. —BIBLIOGRAPHY: Mayer, *Historia Diaboli*; Lecanu, *Histoire de Satan, sa chute, son culte, ses manifestations, ses œuvres*; Carus, *History of the Devil*.

DEVIL-FISH. The popular name of various fishes, one of them being the angler. Among others the name is given to several large species of ray (especially *Ceratoptera Vampyrus* which attains the breadth of 20 feet) occasionally captured on the Atlantic and Pacific coasts of America, and much dreaded by divers, whom they are said to devour after enveloping them in their vast wings. During the gales of wind or owing to strong currents these immense fish are driven into shoal water, and, being unable to extricate themselves, fall an easy prey to the fishermen, who obtain

considerable quantities of oil from their livers. The name is also applied to the larger eight-armed cephalopod



Devil-Fish (or Giant Ray)

molluscs belonging to *Octopus* and allied genera. A combat with one of these is described in Victor Hugo's *Toilers of the Sea.*

DEVIL'S BIT. The common name of a British species of scabious (*Scabiōsa succīsa*), nat. ord. Dipsaceæ. It has heads of blue flowers nearly globular, and a fleshy root, which is, as it were, cut or bitten off abruptly. It flowers from June to October, and is common in meadows and pastures.

DEVIL'S BRIDGE. A name for several bridges in wild situations; one being in Cardiganshire, spanning a gorge of the Mynach; another in Switzerland, over which the St. Gothard Railway crosses the Reuss.

DEVIL'S PARLIAMENT. The name given to a Parliament convened by Henry VI., which met at Coventry in 1459 and unjustly accused the Duke of York of high treason.

DEVIL'S PUNCH-BOWL. A small lake of Ireland, near the lakes of Killarney, between 2000 and 3000 feet above the sea, supposed to be the crater of an ancient volcano. The name is also given to Highcomb Bottom, a glen in Surrey.

DEVIL'S WALL. In the south of Germany, a structure which was originally a Roman rampart, intended to protect the Roman settlements on the left bank of the Danube and on the right bank of the Rhine against the inroads of the Teutonic and other tribes. Remains of it are found from the Danube, in Bavaria, to Bonn, on the Rhine.

DEVIL-WORSHIP. The worship paid to the devil, an evil spirit, a malignant deity, or the personified evil principle in nature, by many of the primitive tribes of Asia, Africa, and America, under the assumption that the good deity does not trouble himself about the world; or that the powers of evil are as mighty as the powers of good, and have in consequence to be bribed and reconciled. There is a sect called devil-worshippers inhabiting Armenia and the valley of the Tigris, who pay respect to the devil, to Christ, and to Allah or the supreme being, and also worship the sun.

DEVISE. In law, usually the disposition of real estate by will, but also sometimes applied to any gift by will, whether of real or personal estate.

DEVITRIFICATION. Glass which has been kept for a considerable time at a temperature just below its fusion-point gradually becomes opaque or crystalline in appearance; this phenomenon is spoken of as *devitrification.* Poor glass, badly prepared window-glass, and glass which has been subjected to strain tend to de-

Devil's Bit

vitrify on exposure to air, some of the ingredients separating in a crystalline form.

DEVI'ZES. A borough of England, county of Wilts, giving name to a parliamentary division, finely situated on a commanding eminence, 82 miles west by south of London. The name is derived from the Lat. *divisæ terræ* (divided lands), because the ancient castle of Devizes was built at the meeting-place of three manors. Agricultural engines and implements are made, and malting is carried on. Pop. (1931), 6058.

DEVON, or **DEVONSHIRE.** A maritime county in the S.W. of England, its northern coast being on the Bristol Channel and its southern on the English Channel; area, 1,671,364 acres, the county being the third largest of England. Its principal rivers are the Torridge and the Taw, flowing north into the Bristol Channel; and the Exe, Axe, Teign, Dart, and Tamar, flowing into the English Channel. From Exeter to the confines of Cornwall extends the wide and barren tract called Dartmoor; but the vale of Exeter, comprising from 120,000 to 130,000 acres, and the south extremity of the county called *South Hams*, limited by a line drawn from Torbay to Plymouth Sound, are amongst the most fertile districts of England.

Products. Tin, lead, iron, copper, manganese, granite, and the clay used by potters and pipe-makers are the chief mineral products. The geological formation of the Old Red Sandstone is so largely developed that the term Devonian has to some extent become its synonym. Agriculture is in a somewhat backward state, owing, probably, to the general preference given to dairy husbandry, for which the extent and richness of its grasslands make the county most suitable. Wheat, barley, beans, pease, and potatoes are the principal crops. About three-fourths of the county is under crops or in pasture. There is a large trade in butter, cheese, and live-stock, and the "clotted" cream and cider of Devonshire are well known as specialities of the county. There are seven parliamentary divisions, each with one member. Pop. (1931), 732,869.—BIBLIOGRAPHY: *Victoria County History, Devonshire*; F. J. Snell, *Devonshire, Historical, Descriptive, and Biographical.*

DEVO'NIAN SYSTEM. In geology, a name originally given to rocks in Devonshire and Cornwall, intermediate between the Silurian and Carboniferous strata, and consisting of sandstones, calcareous slates and limestones, etc. They are divided into lower, middle, and upper series, the middle most abounding in fossils, including corals, crinoids, brachiopods, and molluscs. Devonian rocks occupy a large area in Central Europe, as well as in the United States, Eastern Canada, and Nova Scotia. The terrestrial and lacustrine equivalents are known as the Old Red Sandstone.

DEV'ONPORT. Formerly a county borough and port of England, county of Devon, contiguous to Plymouth. It is the seat of one of the royal dockyards, and an important naval and military station. A bastioned wall and fosse defend the town on the north-east and south sides, while the sea entrance is protected by heavy batteries on Mount Wise. Connected with the dockyards and fortifications are the gun wharf, foundries, machine-works, rope-walks, storehouses, and naval and military barracks. It has no special trade beyond that connected with the dockyards and Government works. Formerly a parliamentary borough, returning two members to Parliament, Devonport now gives its name to a parliamentary division of Plymouth, with which it has been amalgamated since Nov., 1914.

DEVONSHIRE, Spencer Compton Cavendish, eighth Duke of. Long known as Marquess of Hartington, born in 1833, died 1908. He was the eldest surviving son of the seventh Duke of Devonshire, whom he succeeded in the dukedom in 1891. He was educated at Trinity College, Cambridge, where he graduated as M.A. in 1854. He was attached in 1856 to Earl Granville's Russian mission, and in 1857 was elected as a Liberal one of the members for North Lancashire. In 1863 he was for a short time a Lord of the Admiralty, and he then became Under-Secretary for War, being raised to Cabinet rank as War Secretary in 1866. In 1868 he lost his seat for North Lancashire, but became Postmaster-General under Gladstone, and was returned for the Radnor boroughs. In 1871 he was appointed Chief Secretary for Ireland. He went out with the Gladstone ministry in 1874, and on Gladstone's retirement he became the leader of the Liberal party. On the fall of the Conservative Government in 1880 he was elected for North-East Lancashire, and became Secretary for India under Gladstone, being transferred to the War Office in 1882.

In the general election of 1885 he was returned for the Rossendale division of Lancashire. He strenuously opposed Gladstone's Home Rule Scheme of 1886, and became the leader of the Liberal Unionists, but

long declined to take office in the Cabinet. In 1895, however, he became Lord President of the Council, and from 1900 to 1902 he was President of the newly-instituted Board of Education. In 1903 he withdrew from co-operating with Mr. Balfour as Premier, mainly because he disliked the fiscal changes proposed by Chamberlain. He then accepted the position of head of the Free-Trade Unionists.

DEW. Is the name given to the minute drops of water which at certain times appear by night upon grass, flowers, foliage, and other surfaces which readily radiate heat. The first attempts at a scientific explanation of dew were made early in the nineteenth century, when Dr. Wells propounded his theory on the subject. According to this, the origin is to be found in the moisture previously contained in a vaporous state in the atmosphere.

During the day the earth both absorbs and emits heat, but by night its supply of warmth is cut off, while it continues, under favouring circumstances, to lose heat by radiation into surrounding space. For any given state of the atmosphere, in respect of the amount of aqueous vapour it contains in a specified volume, there is a certain temperature at which it can hold just that amount and no more in suspension. If it be cooled to that temperature, it begins to deposit its moisture in the liquid form, and if the cooling proceeds further, more and more is deposited. This particular temperature is the *dew-point* appropriate to the given state of humidity of the air. If the dew-point is below 32° F., the vapour will, when the dew-point is reached, pass directly into the solid form and be deposited as hoar-frost.

While there is a certain amount of truth in the foregoing theory, it does not contain the whole facts of the case. Dr. John Aitken, of Falkirk, Stirlingshire, established by experiments that in most cases probably the dew found on plants does not come mainly from the atmosphere. To some extent it exudes from the plants themselves. They derive moisture from the soil, and in the process of supplying their tissues it passes to their outer surfaces, whence in the daytime it is evaporated into the air.

By night the fall of temperature checks evaporation of this moisture, and when it reached their surfaces, it may remain there in the form of dew-drops. Also, moisture is condensed out of the atmosphere upon the cooler plant surfaces, but even this has more often been yielded not long before to the atmosphere through the medium of the plant tissues, so that upon the whole the plants play a much more important part in the process than had been supposed.

Dew is most copiously produced when there is a large difference between the day and night temperatures. Hence it is favoured by the absence of clouds, which would throw back much of the heat radiated from the earth. Other favouring circumstances are a still condition of the atmosphere, good radiating surfaces, and an abundant supply of moisture in the soil.

DEWAR (dū'ár), **Sir James.** Scientist, born at Kincardine-on-Forth, 1842, educated at Dollar Academy, Edinburgh University—where he was assistant to Lord Playfair when professor of chemistry—and Ghent. In 1873 he was elected Jacksonian professor of experimental philosophy at Cambridge, and in 1879 a professorial fellow of St. Peter's College. In the latter year he also became Fullerian professor of chemistry at the Royal Institution, London. He was a fellow of the Royal Society, was awarded several medals and prizes for his scientific researches, including the Rumford medal in 1894 for his investigations into the properties of matter at its lowest temperatures, this branch of science, with which the liquefaction of air and gases is connected, being peculiarly his own.

He was the first to reduce hydrogen gas to the liquid and solid form. Together with Sir. F. Abel, he was the discoverer of cordite. He was an honorary graduate of several universities, a late president of the Chemical Society and vice-president of the Royal Society, and was president of the British Association in 1902. He contributed numerous papers to the proceedings of the learned societies of Great Britain, and was knighted in 1904. His collected papers on spectroscopy appeared in 1915. He died in March, 1923.

DEWAR FLASK. A flask devised by Dewar for the examination of liquefied gases. It consists of an inner vessel surrounded by a vacuum, which much reduces loss or gain of heat by the liquid. The principle now finds practical application in the "Thermos Flask."

DEWAS. A native state of Central India consisting of two combined states with two chiefs. Total pop. 250,000. Dewas, the chief town, has a pop. of 5200.

DEWBERRY (*Rubus cæsius*). A European plant belonging to the ord. of the Rosaceæ, and to the same genus as the bramble, from which it

is distinguished by its smaller berries, with fewer grains, and by the bloom, resembling dew, with which they are covered, and from which the plant

Dewberry (*Rubus cæsius*)

derives its name. It is common in some parts of England. The Canadian dewberry (*R. procumbens*) yields a much superior fruit.

DE WET, Christian Rudolf. Boer general, born 1854 in the Orange Free State. His father removing into the Transvaal, he fought as a field-cornet at Majuba. As member of the Volksraad (1889-97) he helped to draw the two Dutch republics together, and in the South African War commanded first in Natal, and then in the west under Cronje, whose rescue at Paardeberg he attempted, but unsuccessfully. After March, 1900, he distinguished himself by his attacks on the British lines of communication, and by his skill in evading capture.

He became commander-in-chief of the Free State forces, and was the only undefeated Boer general at the end of the war, after which he, with Louis Botha and Delarey, came to Europe to collect funds for his countrymen. A member of the Legislative Assembly and Minister of Agriculture, Orange Free State, from 1907 to 1914, he joined the rebellion at the outbreak of the European War. Captured at Waterburg on 1st Dec., he was sentenced to a fine of £2000 and six years' imprisonment, but was soon released. He died 3rd Feb., 1922.

DEWEY, George. American naval officer, born at Montpelliier, Vermont, 26th Dec., 1837, died 16th Jan., 1917. He began active service in the Mediterranean squadron, and in 1862, under Farragut, he was present at the passage of Forts Jackson and St. Philip. Lieutenant-commander in 1865, commander in 1872, he was in command of the Asiatic squadron in 1898, when he destroyed the Spanish fleet at Manila on 1st May. He was made Admiral of the Navy and was thanked by Congress. From 1900 till his death he was President of the General Board of the Navy.

DEWEY, John. American philosopher and psychologist, born at Burlington, Vermont, 20th Oct., 1859. Educated at the University of Vermont, he received his Ph.D. degree from Johns Hopkins University. Professor of philosophy at the Universities of Minnesota, Michigan, and Chicago, where he was also director of the School of Education, he became professor of philosophy at Columbia University in 1904. He is one of the two (William James being the other) American leaders of *pragmatism*, a philosophical conception according to which questions that have no bearing on experience and on life have no significance whatever, and are meaningless. (*See* PRAGMATISM). His works include: *Outlines of a Critical Theory of Ethics* (1881), *Study of Ethics* (1894), *My Pedagogical Creed* (1897), *The School and Society* (1900), *Studies in Logical Theory* (1903), *How we Think* (1909), *Interest and Effort in Education* (1913), *Democracy and Education* (1916), *Letters from China and Japan* (1920).

DE WINT, Peter. English landscape painter in water-colours, born 1784, died 1849. He studied in the schools of the Royal Academy, where he occasionally exhibited; but most of his pictures were shown in the exhibitions of the Water-colour Society. English scenery was his favourite subject. He occasionally painted in oil with marked success. Several of his pictures are in the National Gallery and the Victoria and Albert Museum.

DE WITT, Jan. Grand-Pensionary of Holland, celebrated as a statesman and for his tragical end, was the son of Jacob de Witt, burgomaster of Dort, and was born in 1625. He became the leader of the political party opposed to the Prince of Orange, and in 1652, two years after the death of William II., was made Grand-Pensionary. In 1665 the war with England was renewed, and conducted by De Witt with great ability till its termination in 1665. In 1672 Louis

XIV. invaded the Spanish Netherlands and involved Holland in war. De Witt's popularity, already on the decline, suffered still further in the troubles thus occasioned, and he felt it necessary to resign his office of Grand-Pensionary.

At this time his brother Cornelius, who had been tried and put to torture for conspiring against the life of the young Prince of Orange, lay in prison. Jan de Witt went to visit him, when a tumult suddenly arose amongst the people, and both brothers were murdered, 20th Aug., 1672. De Witt was a man of high character, simple and modest in all his relations.—Cf. Motley, *History of the United Netherlands.*

DEW-POINT. The temperature at which the air is saturated with the water-vapour which it contains. If the temperature of the air falls to the dew-point, dew is deposited. The dew-point is determined by means of an instrument called a hygrometer. When the air is "dry," the dew-point is low, and evaporation proceeds rapidly, whilst a "moist" atmosphere is one whose temperature is near the dew-point, and in which evaporation takes place slowly.

DEW POND. Name given to small ponds found on the high ground of the chalk downs of southern England. They are supplied with water by condensation of the thick mists and heavy dews frequent upon the downs in the summer. In making a dew pond the excavation is lined with straw, over which puddled clay is placed, and above this a layer of stones. When the pond is properly made the supply of water is perennial and is a great boon to farmers.

DEWSBURY. A town, England, in the West Riding of Yorkshire, and 27 miles south-west of the town of York, chiefly engaged in the manufacture of heavy woollen cloths, including blankets, carpets, rugs, flannels, and baizes. In 1862 it was made a municipal borough; in 1867 a parliamentary borough, returning one member. Pop. (1931), 54,303.

DEXTER. A term meaning on the right-hand side, chiefly used in heraldry. The *dexter chief point* is a point in the right-hand upper corner of the shield, being in the dexter extremity of the chief.

DEXTRINE, or **BRITISH GUM,** $(C_6H_{10}O_5)x$. A generic name applied to soluble gummy substances intermediate between starch and glucose. They are prepared from starch by the aid of dilute mineral acids or of enzymes, and are usually named according to the colour they give with iodine, e.g. erythro-dextrine, etc. When heated with dilute acids, they are transformed into glucose. They are white, odourless substances, and are good substitutes for gum-arabic. Dextrine is used in calico printing for thickening colours; for the preparation of gums, and for stiffening cloth.

DEXTRO-COMPOUNDS. Bodies which cause the plane of a ray of polarized light to rotate to the right. Dextrine itself, dextro-glucose, naturally occurring in tartaric acid, malic acid, cinchonine, and many other bodies have this property; while others, which have the opposite effect of causing the plane to rotate to the left, are called *lævo-compounds.*

DEY. An honorary title formerly bestowed by the Turks on elderly men and assumed by the rulers (under the Turkish Sultan) of Algiers, Tripoli, and Tunis.

DHAK. E. Indian tree of the leguminous order (*Butea frondosa*). Abundant throughout India, it has bright orange-red flowers which yield a fugitive yellow dye, and seeds which furnish moodooga oil. It exudes a latex hardening into a brittle, ruby-tinted gum called Bengal kino. The fibre serves for cordage; the wood, leaves, and flowers are used in religious ceremonies.

DHALAK (dhâ-lâk'). An archipelago of the Red Sea, belonging to the Italian territory of Eritrea. It consists of nearly 100 islets, mostly uninhabited, clustering round the Island of Dhalak-el-Kebir, which is about 35 miles long by 30 miles broad. This island possesses a pearl-fishery.

DHAR (dhär). A small native state in Central India, with an area of about 1783 sq. miles. The soil is fertile, and yields wheat, rice, and opium. Pop. 169,474.—The capital is of the same name, is surrounded by a mud wall, and has some striking buildings. Pop. 20,000.

DHÂRANGAON. A town of India, in Khandesh district, Bombay. Pop. 15,000.

DHARMSALA. A hill station with military cantonments, in Kangra district, Punjab, India. Pop. 6170.

DHARWAR. The chief town of Dharwar district, in the Bombay Presidency, India, a straggling place with some trade. There is a fort well planned and strongly situated, but now falling into ruins, and military cantonments at 2 miles distance. Pop. 34,750.—The Dharwar district has an area of 4535 sq. miles; pop. 1,051,314.

DHAWALA'GIRI, or **DHAULAGIRI.** One of the highest peaks of the Himalayas, in Nepál; height, 26,828 feet.

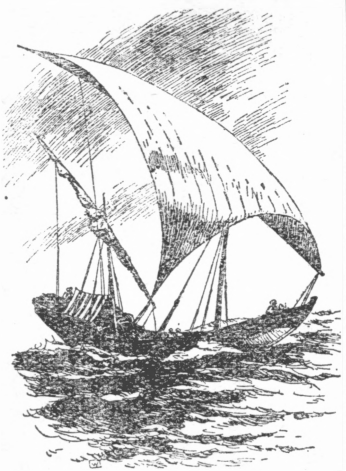
DHOLE (dōl). The Cingalese name for the wild dog of India (*Cyon dukhunensis*). It is distinguished from the genus Canis or dog proper by its having one molar fewer in either side of the lower jaw. It is of a fox-red or rufous-fawn colour, in size between a wolf and a jackal, and hunts always in packs.

DHOLERA (dhō-lā'r*a*). A town of India, Bombay Presidency, on a stream entering the Gulf of Cambay, an important cotton-mart. Pop. 10,190.

DHOLKA. A town of India, Bombay Presidency, probably one of the oldest towns in Gujarat. Pop. 13,000.

DHOLPUR. Native state of Central India, Rájputána; area, 1155 sq. miles; pop. 230,188.—The capital is also called Dholpur. Pop. 17,000.

DHOW (dou). An Arab sea-going vessel, ranging from a comparatively small size up to 200 tons burden,



Dhow

with one mast and a large triangular (*lateen*) sail. It is used for merchandise and is often employed in carrying slaves from the east coast of Africa to Arabia.

DHÚLIA. A town of India, Khandesh district, Bombay Presidency. Pop. 29,497.

DIABASE. Originally an equivalent of diorite; then used for chloritic igneous rocks of the Intermediate series of various grain; and now usually for a type of dolerite in which the felspar is embedded in augite.

DIABE'TES. Is a disease characterized by great thirst, a voracious appetite, and the passage of large quantities of saccharine urine, while there is usually marked emaciation and debility. As a rule the skin is dry and the patient does not perspire. Skin irritations (pruritus) of an intense type occur frequently and cause much discomfort. Constipation is the rule, but the digestion usually remains good, and enormous quantities of food are taken without causing disturbance.

Acute and chronic forms are recognized, but there is no essential difference, except that in the former the patients are younger, the course more rapid, and the emaciation more marked. Beyond the large quantity, the outstanding feature of the urine is the presence of sugar, varying from 2 per cent. in mild cases to 10 per cent. in severe cases.

Cause. The disease is due to disturbance in the carbohydrate metabolism, with the result that these carbohydrates are not properly assimilated, but passed as sugar in the urine. Much research has been undertaken to find what organ or organs of the body cause this defect in metabolism, and recent work in connection with the pancreas has established a definite relationship between cells in that organ and the disease.

Treatment. In treatment the main consideration is to reduce the carbohydrates in the dietary, and many diets have been produced for this purpose.

Diabetic patients may take:—liquids: clear soups, lemonade, coffee, tea, cocoa (without sugar), soda-water and such like waters, or milk (in moderation); animal foods: fish of all sorts, fresh meat, poultry, game, eggs, butter, cream-cheese; vegetables: lettuce, tomatoes, spinach, radishes, asparagus, water-cress, cucumbers, chicory, mustard; fruits: lemons, oranges, and in moderation currants, plums, cherries, pears, apples (tart), melons, raspberries, strawberries, nuts; bread: gluten bread, almond or coconut biscuits. A substitute for bread is one of the greatest difficulties, as many gluten foods are very unpalatable.

Mild cases can be treated successfully if the patient is restricted to a suitable diet. In more serious cases insulin must be given, the amount varying according to the severity of

the condition. Insulin must be administered hypodermically, as it is not effective when taken by the mouth. Great care must be taken to insure that only the required amount is used, as very serious consequences may follow an overdose. Since the discovery of insulin treatment diabetic patients may lead a comparatively normal life, but can on no account discontinue the use of the drug.

DIABLERETS (dē-âb-lē-rā), **Les.** A mountain group of the Bernese Alps, Switzerland, between the cantons Vaud and Valais. The highest peak has a height of 10,620 feet.

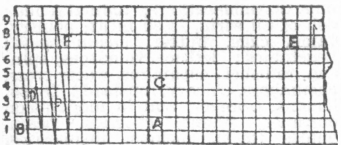
DIACHYLON (dī-ak'ī-lon). A substance prepared by heating together oxide of lead or litharge, olive-oil, and water, until the combination is complete, and replacing the water as it evaporates. It is used for curing ulcers, and is the basis of many plasters.

DI'ADEM (Gr. *diadein*, to bind round). An ancient ornament of royalty. It was originally a headband or fillet made of silk, linen, or wool, worn round the temples and forehead, the ends being tied behind and let fall on the neck, as seen in old representations of the diadem of the Indian Bacchus. In later times it was usually set with pearls and other precious stones. The term is also used as equivalent to crown or coronet.

DIÆ'RESIS. A separation of one syllable into two, also the mark (··) by which this separation is distinguished, as in *aërial*.

DIAGNO'SIS. In medicine, the recognition of diseases by their distinctive signs or symptoms; the discovery of the true nature and seat of a disease.

DIAG'ONAL SCALE. A scale which consists of a set of parallel lines drawn on a ruler, with lines crossing them at right angles and at equal distances. One of these equal



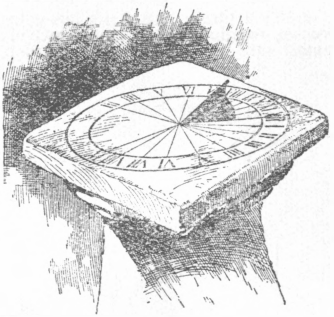
Diagonal Scale

divisions, namely, that at the extremity of the ruler, is subdivided into a number of equal parts, and lines are drawn through the points of division obliquely across the parallels. With the help of the compasses such a scale facilitates the laying down of lines of any required length to the 200th part of an inch. The length 1·67 inches, for example, is given by EF in the figure. Similarly AB = ·91 inch, CD = ·84 inch.

DIAG'ORAS. Ancient Greek poet and philosopher, born in Melos, an island of the Cyclades, and flourished about 425 B.C. He spent a great part of his life in Athens. Like his teacher, Democritus, he attacked the prevailing polytheism, and sought to substitute the active powers of nature for the divinities of the Greeks. On this account he had to leave Athens.

DI'AGRAM (Gr. *diagraphein*, to describe). A figure of geometrical delineation applied to the illustration or solution of geometrical problems, or any illustrative figure in which outlines are chiefly presented, and the details more or less omitted.

DIAL, or SUN-DIAL. An instrument for showing the hour of the day from the shadow thrown by a *stile* or *gnomon* upon a graduated surface



Sun-Dial

while the sun is shining. This instrument was known from the earliest times amongst Egyptians, Chaldeans, and Hebrews. From those Eastern nations it came to the Greeks. It was introduced into Rome during the first Punic War.

Dials are of various construction, horizontal, inclined, or upright, the principle in every case being to show the sun's distance from the meridian by means of the shadow cast by the stile or gnomon. The stile is made parallel with the earth's axis, and may be considered as coinciding with the axis of the sun's apparent diurnal motion. Consequently, as the sun moves westwards the shadow of the stile moves round opposite to it, in the same direction, falling successively on lines drawn to represent the hours of the day.

The dial, of course, gives true solar or *apparent* time, which, except on four days of the year, is somewhat different from *mean* time. Dials are now rather articles of curiosity or ornament than of use.—BIBLIOGRAPHY: Leybourn, *The Art of Dialling*; Dawbarn, *The Sun-dial*.

DI'ALECT. The language of a part of a country, or a distant colony, deviating either in its grammar, vocabulary, or pronunciation, from the language of that part of the common country whose idiom has been adopted as the literary language, and the medium of intercourse between well-educated people. Although the use of provincial dialects becomes inconvenient after a language has acquired a fixed literary standard, the study of such dialects is always valuable to the philologist for the light they throw on the history of the language. The diffusion of education and of printed books has much relaxed the hold which the provincial dialects of various countries once had on the people, and in general it may be said that the educated classes of any country now speak each of them a uniform language.

DIALEC'TICS (Gr. *dialektice*, from *dialektos*, discourse, dialogue). A philosophic term originally signifying *investigation by dialogue*. It was first used by Plato to designate the Socratic method. Afterwards it came to denote the art of inference or argument, and in this sense was synonymous with *logic*. The term is used in Kant's philosophy to mean the logic of appearance, or that logic which treats of inevitable tendencies towards error and illusion in the very nature of reason.

DI'ALLAGE. An altered form of the mineral augite, with a lamellar structure, and a submetallic lustre on its planes of separation. Schillerstein, or schiller spar is a similar product of the allied but rhombic mineral hypersthene. It forms diallage rock, and enters into serpentine rock.

DIALLING. The art of making sun-dials; also the art and practice of mine-surveying, in which the theodolite and magnetic needle are employed.

DI'ALOGUE. A conversation or discourse between two or more persons. The word is used more particularly for a formal conversation in theatrical performances, and for a written conversation or composition, in which two or more persons carry on a discourse. This form was much in favour amongst the ancient philosophers as a medium for expressing their thoughts on subjects. The *Dialogues* of Plato are the finest example. Many of the great French and Italian writers have used this form. In the seventeenth century Fontenelle and Fénelon both wrote *Dialogues des Morts*, a title borrowed from Lucian. Landor's *Imaginary Conversations* (1821-8) is the best production of this kind in English.

DIAL'YSIS. The process by means of which a crystalline substance may be separated from a colloidal body. Certain substances are capable of passing through parchment, others are not, e.g. a solution containing sugar and silicic acid may be separated by placing the solution in a parchment-paper tube suspended in water; the silicic acid remains in the parchment tube, and the sugar passes through into the surrounding water. The solution is said to be dialyzed.

DIAMAGNET'IC. A term applied to substances which, when under the influence of magnetism and freely suspended, take a position at right angles to the lines of magnetic force. From the experiments of Faraday it appears that all matter is subject to the magnetic force as universally as it is to the gravitating force, arranging itself into three divisions, the *ferromagnetic*, *paramagnetic*, and *diamagnetic*. Among the former are iron, nickel, cobalt, magnetic oxide of iron, and Heusler's alloy.

The more feebly magnetic bodies are classed as paramagnetics, and those which behave as described above are called diamagnetic substances. Among the latter are bismuth, antimony, cadmium, copper, gold, lead, mercury, silver, tin, zinc, and most solid, liquid, and gaseous substances. A diamagnetic body is one which is not so magnetic as the medium in which it is suspended. The action of bismuth, the strongest diamagnetic substance, is weak when compared with the magnetic action of iron.

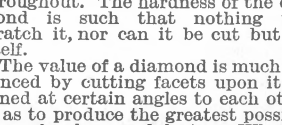
DIAMANTI'NA. A city, Brazil, in the diamond-mining district in the state of Minas Geraes. Many of the inhabitants are engaged in the gold and diamond trade; there is industrial activity in diamond-cutting, etc. Pop. about 15,000.

DIAM'ETER (Gr. *dia*, through, and *metron*, measure). The straight line drawn through the centre of a circle and terminated by the circumference. It thus divides the circle into two equal parts, and is the greatest chord. The length of the diameter is to the length of the circumference of the circle as 1 to 3·14159265 . . . , the latter being an interminable decimal. The name is also given to any

chord of a conic which passes through its centre.

DI'AMOND. The hardest and one of the most valuable of gems, and the purest form in which the element carbon is found. (*See* CARBON.) It crystallizes in forms belonging to the regular or cubic system, the most common being the regular octahedron and rhombic dodecahedron (twelve faces). The finest diamonds are colourless, perfectly clear, and pellucid. Such are said to be of the finest *water*. But diamonds are often blue, pink, green, or yellow, and such are highly prized if of a decided and equal tint throughout. The hardness of the diamond is such that nothing will scratch it, nor can it be cut but by itself.

The value of a diamond is much enhanced by cutting facets upon it inclined at certain angles to each other so as to produce the greatest possible play of colour and lustre. What is called the *brilliant* cut best brings out the beauty of the stone. Its upper or principal face is octagonal, sur-



Diamonds, rough and variously cut

rounded by many facets. But this form of cutting requires an originally well-shaped stone. For other diamonds the *rose* cut is used. In this form six triangles are cut on the top so that their apices meet in a point called the summit. Round this are disposed other facets.

Stones which are too thin to cut as rose-diamonds are cut as *table*-diamonds, which have a very slight play of colour. In the cut, fig. 1 is the diamond in its rough state; fig. 2 is the vertical, and fig. 3 the lateral appearance of a brilliant; fig. 4 the vertical, and fig. 5 the lateral appearance of a rose-cut diamond; in fig. 6 the flat portion *a* in a cut stone is called the *table*; the part *a b b*, which projects from the setting, is the *front*, the part *b b c*, sunk in the setting, is the *back* or *culasse*, while the line *b b* is the *girdle*.

The art of cutting and polishing the diamond was unknown in Europe till the fifteenth century, and the stone itself was not nearly so highly valued in the Middle Ages as the ruby. Diamonds are valuable for many purposes. Their powder is the best for the lapidary, and they are used for jewelling watches, and in the cutting of window- and plate-glass. When used as a glazier's tool the diamond must be uncut. Inferior kinds of diamonds are also extensively used by engineers in rock-boring, and by copper-plate engravers as etching-points. Diamonds are obtained from deposits of various kinds, mostly alluvial (sands, clays, etc.), being separated by washing.

They have been found in India, Borneo, and other parts of the East; sometimes in N. America and Australia; Brazil has produced large numbers; but the chief diamond-field of to-day is in Cape Province, the centre being Kimberley. Diamonds were discovered here in 1867, and since then the output has amounted to over £183,000,000 in value. The diamonds are no longer obtained by mere surface workings, but the excavations have been carried down to a depth of 2000 feet. "River diggings" are also carried on on the banks of some of the rivers. Some of the S. African diamonds are very large. One of them, the Cullinan diamond, discovered in 1905, is a monster of 3025 carats, of very good colour, being by far the largest diamond known.

A celebrated diamond is the Koh-i-noor (Mountain of Light), an Indian stone belonging to the British crown. Its history extends over five or six centuries. It weighed at one time 280 carats, but by cutting has been reduced to about 106 carats. The Orlov diamond, which belonged to the Emperor of Russia, weighed 194 carats; the Pitt diamond, among the French crown jewels, weighs 136½ carats.—BIBLIOGRAPHY: A. Jeffries, *A Treatise on Diamonds and Pearls*; H. Emanuel, *Diamonds and Precious Stones*; E. W. Streeter, *Precious Stones and Gems*; *idem*, *The Great Diamonds of the World*; G. F. H. Smith, *Gem-stones*; P. A. Wagner, *The Diamond Fields of Southern Africa*.

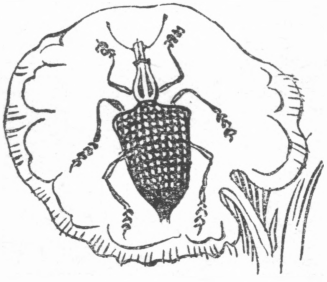
DIAMOND-BEETLE, *Entimus imperialis*. A handsome South American insect belonging to the family Curculionidæ or weevils. It is spangled with golden-green on a black background.

DIAMOND HARBOUR. A port on the left bank of the Hugli River, about 38 miles by the railway from Calcutta, formerly much used as an anchorage for ships waiting for the tide.

DIAMOND LORE. In Hellenic, Arabian, Chinese, and other literature, the diamond is connected with the eagle and snakes. Diamonds, according to

ancient belief, lie in deep valleys infested by snakes, or entirely surrounded by straight, high cliffs. Pieces of flesh are thrown down and eagles seize them. The birds are followed to their nests, where the diamonds that adhered to the flesh are found. Mixed with this legend is the older one regarding the "eagle stone," which assists parturition. It was believed a woman was easily delivered if the "eagle stone" were placed on her abdomen. The Chinese legend was imported with the diamond from Fulin (Syria).

Indian diamond lore is mixed with pearl lore. According to the Buddha birth stories, diamonds are found in the sea. The ancients asserted that the diamond could not be injured by iron, fire, or smoke. Before it could be broken it had to be steeped in ram's blood. The alchemists used lead as a substitute for ram's blood.



Diamond-Beetle (*Entimus imperialis*)

In Chinese lore diamonds are rulers of gold and have their origin in gold. A similar belief prevailed in mediæval Europe, adamantine gold being credited with the same virtues as the diamond. Both gold and the diamond were sacred. The diamond is a mediæval symbol of Christ; in the Far East it is connected with Buddha. The association of the diamond with snakes gave origin to the belief that it was poisonous, the saliva of the snakes clinging to it.

Diamond dust is regarded in India as a deadly poison. Like the sacred pearl, the diamond has been credited with nocturnal luminosity. Certain varieties of diamonds when heated, rubbed, or exposed in bright sunshine emit slight rays of light for a short time in darkness. The belief in "night shining gems," however, had origin in pearl lore, the pearl having been connected with the moon ("the pearl of heaven"). Coral, rhinoceros-horn, fern seed, the mandrake, etc., were likewise connected with the moon-goddess and credited with nocturnal luminosity.

DIAMOND NECKLACE. An affair of some note in French history immediately preceding the Revolution. *See* MARIE ANTOINETTE; LA MOTTE; and ROHAN, LOUIS.

DIAN'A. In Roman mythology, an ancient Italian goddess, in later times identified with the Greek Artĕmis, with whom she had various attributes in common, being the virgin goddess of the moon, and of the chase, and

Figure of Artemis, the Diana of Ephesus

having as attributes the crescent moon, bow, arrows, and quiver. The name is a feminine form of Janus. She seems to have been originally the patron divinity of the Sabines and Latins. She was worshipped especially by women, as presiding over births, no man being allowed to enter her temple.

DIANA-MONKEY (*Cercopithĕcus Diana*). A species of monkey found in West Africa, and so named from the crescent-shaped band on the forehead resembling the crescent moon, which was the symbol of Diana. Another characteristic feature is the possession of a pointed white beard.

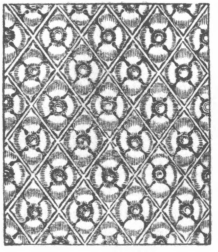
DIANA OF POITIERS. Duchess of Valentinois, born in 1499. She was the mistress of King Henry II. of

France, and descended from the noble family of Poitiers, in Dauphiny. At an early age she married the Grand-Seneschal of Normandy, Louis de Brézé, became a widow at thirty-one, and some time after the mistress of the young Duke of Orleans. On his accession to the throne in 1547, as Henry II., Diana continued to exercise an absolute empire over him till his death in 1559. After that event she retired to her castle of Anet, where she died in 1566.—Cf. Capefigue, *Diane de Poitiers*.

DIANTHUS. Genus of herbs of the carnation-pink order. They are native to the N. temperate regions and to S. Africa. Of 70 species, several grow wild in Britain, notably the Maiden, Deptford and Cheddar pinks. The Mediterranean clove pink originated all the garden varieties of carnation; from the pheasant's eye come many garden pinks, the bearded pink and the sweetwilliams.

DIAPA'SON. In music, the concord of the first and last notes of an octave. The word is also used for the most important foundation-stops of an organ. They are of several kinds, as *open diapason, stopped diapason, double diapason.* The French use the term as equivalent to pitch in music.

DI'APER. A kind of textile fabric much used for towels and napkins, and formed either of linen or cotton,



Diaper Ornamentation
Westminster Abbey

or a mixture of the two, upon the surface of which a flowered or figured pattern is produced by a peculiar mode of twilling.—As a term in ornamentation diaper is applied to a surface covered with a flowered pattern sculptued in low relief, or to a similar pattern in painting or gilding covering a panel or flat surface.

DIAPHANOSCOPE. (1) An apparatus by means of which transparent positive photographs may be viewed. The name is also given to (2) an instrument employed in obstetrical surgery; electric light, contained in a glass tube or bulb, is introduced into the female internal organs, and, thus illumined, their condition can be examined through the translucent walls of the abdomen.

DIAPHORET'ICS (Gr. *diaphorein*, to carry through). Are agents used in medical practice to produce perspiration. The Turkish bath, hydropathic treatment, diluent drinks, etc., are employed for this purpose. The degree of perspiration produced is more than normal, but less than in sweating. *See* SUDORIFICS.

DIAPHRAGM (di'a-fram). In anatomy, a muscular membrane placed transversely in the trunk, and dividing the chest from the abdominal cavity. In its natural situation the diaphragm is convex on the upper side and concave on its lower, but when the lungs are filled with air it becomes almost flat. It is the principal agent in respiration, particularly in inspiration. A complete diaphragm is found only in Mammalia.

DIARBEKR. A town of Kurdistan, in Asiatic Turkey, capital of the vilayet of same name, on a high bank overlooking the Tigris, and surrounded by a lofty massive wall. It has manufactures of iron- and copperware, leather, silk, woollen, and cotton goods, and a considerable trade. Pop. about 30,709.—The vilayet of Diarbekr has a pop. of 194,316.

DIARRHŒ'A. Is morbidly frequent evacuation of the bowels. Several forms are recognized. *Choleraic diarrhœa*; this form is acute, and is marked by great frequency, with serous stools, and accompanied by vomiting and collapse. *Critical diarrhœa* occurs at the crisis of a disease. *Lienteric diarrhœa* is marked by the passage of fluid stools containing scraps of undigested food. *Mucous diarrhœa* is marked by the presence of mucous in the stools. *Summer diarrhœa* occurs chiefly among young children and infants, most frequently in late summer. It is usually acute in type and associated with marked prostration. In epidemic form it may give rise to a high mortality in crowded districts and in institutions.

Nervous diarrhœa is produced by some emotional cause. The treatment, whatever the type, is to get rid of the cause of the irritation, and to avoid further irritation in the intestinal tract. For this purpose purgatives are given, and all solid food forbidden. This is followed by gastro-intestinal sedatives and a gradual return to normal diet—substances causing least digestive difficulty being first given.

DIASTASE. Is an unorganized ferment or enzyme produced in the germination of barley, oats, etc. It is soluble in water, and the solution has the property of inducing fermentation or hydrolysis of starch into dextrine and glucose. To prepare diastase barley is allowed to germinate; germination is then interrupted by raising the temperature, and the grain is treated with a mixture of water and alcohol under pressure, and filtered. Diastase, being soluble, is obtained in the filtrate.

DIATHER'MANCY, The property that is possessed in various degrees by different substances, of transmitting radiant heat. Bodies that are equally transparent, that is, bodies which have equal power of transmitting rays of light, are very different in their power of transmitting heat-rays. Thus, a thin plate of glass and a thin plate of rock-salt may be nearly equally transparent, but the plate of rock-salt has far superior power of transmitting rays of heat. The latter, it has been found, allows 92 per cent of the total heat from most sources to pass; glass and other substances transmit a much smaller proportion, and the amount varies with the source.

Rock-salt is diathermanous to heat from nearly all sources. It has been shown that rock-salt is extremely opaque or athermanous to the radiations from a piece of heated rock-salt. The diathermancy of the plates in every case decreases very rapidly as their thickness is increased. *See* RADIATION.

DIATH'ESIS. Is the term given in medicine to a constitutional predisposition to a disease; thus uratic diathesis is a tendency to gout; aneurysmal diathesis is an inherent predisposition to aneurysms.

DIATOMA CEÆ. A family of Algæ, consisting of microscopic unicellular plants with brown chromatophores found in fresh, brackish, and salt water, and on damp ground. The cell wall contains a very large quantity of silica, and is formed in each cell into three portions, viz. two generally symmetrical valves and a connecting hoop. The species consist of single free cells, or the cells remain connected so as to form usually linear colonies, sometimes enclosed in a transparent gelatinous sheath. The ordinary method of increase is by cell division. A sexual process resembling that of the conjugatæ also occurs.

Diatoms constitute an important source of food for the lower marine animals, and thus indirectly for the food-fishes. Diatomaceæ are found fossil, forming considerable deposits of tertiary age, as at Bilin, Richmond in the United States, etc. Fossil polishing-powders, as tripoli and bergmehl, are composed of them; also kieselguhr, which, impregnated with nitro-glycerine, forms dynamite. They are abundant in guano.

DIAT'OMITE (Ger. *kieselguhr*). A diatomaceous earth (*see* DIATOMACEÆ) generally found underlying peat. In Skye, at Loch Quire, it is found about 18 inches below the surface, and extends downward for about 7 feet, and in some places to a much greater depth. Another important area is north of Toome Bridge in the county of Antrim. Diatomite is principally used for the manufacture of dynamite on account of its value as an absorbent. It is described also as extremely well adapted for the manufacture of silicate paints, siliceous glazings, porcelain, boiler-coatings, and for isolating felt and bricks for cold-storage buildings.

DIATON'IC. A term originally applied by the Greeks to one of their three genera of music. In modern music it is applied to the natural scale, and to the intervals, chords, melodies, or harmony characteristic of it. A diatonic chord is a chord having no note chromatically altered. A diatonic interval is an interval formed by two notes of the diatonic scale unaltered by accidentals. A diatonic melody is a melody composed of notes belonging to one scale only.

DIAZ, Bartolommeo. A celebrated Portuguese navigator of the fifteenth century, named in 1486 commander of one of that long succession of exploratory expeditions which the Portuguese court had during this century become distinguished for promoting. The two vessels composing the expedition sailed along the African coast till they reached Cape Negro (lat. 15° 50′ S.), where Diego Cam, a previous explorer, had stopped. At 29° S. they anchored at a point to which they gave the name of Angra das Voltas (Bay of Detours).

In sailing south from this point they doubled the Cape of Good Hope without knowing it, and landed at a bay on the east coast. Diaz now wished to continue his voyage in order to discover the country of Prester John, but the sailors refused to accompany him. In again doubling the Cape he gave it the name of Cabo Tormentoso (Cape of Storms), which the king changed to its present designation. In 1500 Diaz had command of a vessel in the expedition of Cabral which discovered Brazil. In returning home the vessel which he commanded was lost, 29th May, 1500.

DIAZO COMPOUNDS, or DIAZONIUM COMPOUNDS. A name given to substances containing the chemical group $-N:N-$; thus diazo-benzene chloride, $C_6H_5-N:N\cdot Cl$, or diazo-toluene sulphate, $C_6H_4(CH_3)-N:N\cdot HSO_4$, etc.

These substances are formed from the aromatic amines by treatment with nitrous acid at low temperatures. Primary amines all react with nitrous acid at moderate temperatures when the amino group (NH_2) is replaced by a hydroxyl group (OH); thus ethylamine ($C_2H_5NH_2$) reacts with nitrous acid (HNO_2), yielding alcohol (C_2H_5OH), $C_2H_5NH_2 + HNO_2 = C_2H_5OH + N_2 + H_2O$. The aromatic amines, however, if treated below 0° C. with nitrous acid, yield diazo compounds, and not hydroxy compounds, e.g. aniline treated with nitrous acid in hydrochloric acid solution yields diazo-benzene chloride, $C_6H_5NH_2\cdot HCl + HONO = C_6H_5-N:N\cdot Cl + 2H_2O$. Diazo salts are crystalline compounds soluble in water, sparingly soluble in alcohol and are unstable, decomposing explosively if struck or suddenly heated. In solution in water they decompose as the temperature rises, liberating nitrogen, and forming hydroxy compounds, $C_6H_5N:NCl + H_2O = C_6H_5OH + N_2 + HCl$. Diazo salts are valuable in the synthesis of different classes of compounds, as the $-N:N-$ group reacts readily with other groups.

For this purpose it is usually only necessary to prepare a solution containing the diazo compound. In the preparation of the azo dyes the starting-point is a primary amine; the amino group is "diazotized," i.e. treated with a solution of sodium nitrite and dilute mineral acid at low temperature. A diazo salt is formed, and is then made to react in solution with a hydroxy compound or an amino compound, etc., with the formation of a highly coloured azo compound. The diazo compound is then said to be coupled. Diazo compounds are therefore important intermediate substances in the manufacture of azo dyes.

The diazo group may also be exchanged for the hydroxyl group by warming the solution with water, or for the cyanogen group by warming with a solution of potassium cyanide, e.g. diazo-benzene chloride warmed with potassium cyanide solution is converted into the nitrile of benzoic acid, $C_6H_5-N:NCl + KCN = C_6H_5CN + KCl + N_2$; or transformed into halogen derivatives of hydrocarbons by warming with cuprous chloride, e.g. diazo-benzene chloride is transformed into chlorobenzene, $C_6H_5-N:NCl + Cu_2Cl_2 = C_6H_5Cl + N_2 + Cu_2Cl_2$. These reactions, where nitrogen is eliminated from the compound, and a group or element replaces the two atoms of nitrogen, afford a means of synthesizing a variety of compounds.

DIB'DIN, Charles. An English dramatic manager and poet, composer and actor, born in 1745, died in 1814. At the age of fifteen he made his appearance on the stage, and was early distinguished as a composer. He invented a new kind of entertainment, consisting of music, songs, and public declamations, which he wrote, sang, composed, and performed himself, and by this means succeeded in amusing the public for twenty years.

In 1769 he composed some of the music for the Shakespeare jubilee at Stratford-on-Avon. His patriotic songs were very popular, and his sea-songs, amongst which are *Tom Bowling*, *Poor Jack*, and *The Trimbuilt Wherry*, are still favourites in the British navy. He also wrote a *History of the Stage*, and the novels *The Devil* and *Hannah Hewitt*.—His son, Charles Dibdin, composed and wrote many small pieces and occasional songs.—Another son, Thomas, early displayed the same dramatic tastes as his father, was connected with various theatres, and wrote a great many songs and a number of dramas.

DIBDIN, Thomas Frognall. An English bibliographer, born in 1776, died in 1847, was the son of the elder brother of Charles Dibdin the celebrated naval song writer. After studying law and practising as a provincial counsel, he took orders and became a popular preacher in London. Here his bibliographical tastes developed themselves, and the Roxburghe Club being established in 1812, he became its first vice-president. Among his numerous writings may be noted: *Bibliomania*, *Bibliographical Decameron*, *Typographical Antiquities of Great Britain*, and *The Library Companion*.

DIBRANCHIA'TA. *See* CEPHALOPODA.

DICE. Cubical pieces of bone or ivory, marked with dots on each of their six faces, from one to six, according to the number of faces. They are shaken in a small box and then thrown on the table. Dice are often loaded or falsified in some way so as to make the high or the low sides turn down. The origin of dice is ascribed to Palamedes of Greece (1244 B.C.), although Herodotus attributes the invention of knuckle-bones and of dice to the Lydians. Dice were well known amongst the ancient Egyptians and Greeks, and are still very

popular in Japan, China, India, and other Asiatic countries.

DICEN'TRA. *See* DIELYTRA.

DICHASIUM. *See* CYME.

DICHLAMYDEOUS (di-klam-id'i-us). In botany, said of plants that have both calyx and corolla.

DICHOGAMY. In flowers, the condition in which anthers and stigmas ripen at different times, whereby self-pollination is effectually prevented. If the anthers ripen first, as in boarge, columbine, crocus, Caryophyllaceæ, Compositæ, Labiatæ, etc., the flower is said to be protandrous; protogynous flowers, with stigmas ripening and withering before the pollen is shed, occur, e.g. in Christmas rose, Colchicum, horse-chestnut, and in the majority of wind-pollinated plants.

DICHOTOMY (di-kot'o-mi). A cutting in two; a division by pairs. Hence, in botany, a mode of branching by constant forking, each branch dividing into two others. *See* BRANCHING.

DICHROIC, or more generally **PLEOCHROIC, CRYSTALS** (di-krō'-ik). Crystals that have the property of exhibiting different colours, according to the direction in which they are traversed by rays of light. When polarized light is passed through a transparent plate of a pleochroic mineral, the colour will vary with the direction in which the light-vibrations take place. Hence, *face-pleochroism*, the colour of the plate, may be distinguished from the colours given by *axis-pleochroism*, the colour given by light vibrating parallel with certain optical directions in the crystal.

DICHROITE (di'kro-it), or **IOLITE.** A mineral, a silicate of magnesium, iron, and aluminium, which readily undergoes modifications and passes into hydrous silicate. It exhibits marked pleochroism, whence the name.

DICK, Thomas, LL.D. A Scottish author of popular scientific works, born at Dundee in 1774, died 29th July, 1857. He was for many years a teacher at Perth, but subsequently resided at Broughty-Ferry, where he devoted himself to astronomical science, especially in its relations to religion. Some years before his death a small pension was granted to him by the Government. Amongst his works are: *The Christian Philosopher* (1823), *The Philosophy of Religion* (1825), *The Philosophy of a Future State* (1828), and *Celestial Scenery* (1838).

DICKENS, Charles. One of the greatest English novelists, born 7th Feb., 1812, at Landport, Portsmouth, died 9th June, 1870. His father, John Dickens, was then in the employment of the Navy Pay Department, but subsequently became a newspaper reporter in London. Young Dickens received a somewhat scanty education, was for a time a mere drudge in a blacking warehouse, and subsequently a clerk in an attorney's office. Having perfected himself in shorthand, however, he became a newspaper critic and reporter, was engaged on *The Mirror of Parliament* and *The True Sun*, and in 1835 on *The Morning Chronicle*. For some time previously he had been contributing humorous pieces to *The Monthly Magazine*; but at length, in 1835, appeared in *The Morning Chronicle* the first of that series of *Sketches by Boz* which brought Dickens into fame. It was followed in quick succession by a pamphlet entitled *Sunday under Three Heads, by Timothy Spark* (1836); *The Tuggs at Ramsgate* (1836); *The Village Coquette*, a comic opera (1836); and a farce called *The Strange Gentleman* (1836).

In the same year Chapman & Hall engaged the new writer to prepare the letterpress for a series of comic sketches on sporting subjects by Seymour, an artist who had already achieved fame, and suggested as a subject the adventures of an eccentric club. Seymour committed suicide soon after, and H. K. Browne joined Dickens as illustrator, the result being the immortal *Pickwick Papers*.

The great characteristics of Dickens's genius were now fully apparent, and his fame rose at once to the highest point it was possible for a writer of fiction to reach. A new class of characters, eccentric indeed, but vital representations of the humours and oddities of life, such as Mr. Pickwick, Sam Weller and his father, Mr. Winkle, and others, was made familiar to the public. Under the name of *The Posthumous Papers of the Pickwick Club* this work was published in 2 vols. 8vo, in 1837. In the same year Dickens was engaged as editor of *Bentley's Magazine*, to which he contributed *Oliver Twist*, a work which opened up that vein of philanthropic pathos and indignant satire upon institutions which became a distinguishing feature of his works.

Before the completion of *Oliver Twist*, *Nicholas Nickleby* was begun, being issued complete in 1839. As the special object of *Oliver Twist* was to expose the conduct of workhouses, that of *Nicholas Nickleby* was to denounce the management of cheap boarding-schools. *Master Humphrey's Clock*, issued in weekly numbers, contained among other matter two

other leading tales, *The Old Curiosity Shop* and *Barnaby Rudge*, the latter a historical tale, going back to the times of the Gordon riots. It was published complete between 1840 and 1841.

In 1841 Dickens visited America, and on his return he wrote *American Notes for General Circulation* (1842). His next novel, *Martin Chuzzlewit* (1844), dwelt again on his American experiences. This work also added a number of typical figures—Mr. Pecksniff, Mark Tapley, Sarah Gamp, and others—to English literature. The series of *Christmas Tales*, in which a new element of his genius, the power of handling the weird machinery of ghostly legend in subordination to his own peculiar humour, excited a new sensation of wonder and delight. These, enumerated consecutively,

Charles Dickens

were : *A Christmas Carol* (1843), *The Chimes* (1844), *The Cricket on the Hearth* (1845), *The Battle of Life* (1846), *The Haunted Man* and *The Ghost's Bargain* (1847). The extraordinary popularity of these tales created for a time a new department in literature, that of the sensational tale for the Christmas season.

In 1845 Dickens went to Italy, and on his return *The Daily News*, started on 1st Jan., 1846, was entrusted to his editorial management ; but, despite his early training, this was an occupation uncongenial to his mind, and in a few months the experiment was abandoned. His *Pictures from Italy* were published the same year. Next followed his novel of *Dombey and Son* (1848), and *David Copperfield*, a work which has a strong autobiographical element in it (1849-50). In 1850 Dickens became editor of the weekly serial *Household Words*, in which various original contributions from his own pen appeared. In 1853 his *Bleak House* came out. *A Child's History of England*, commenced in *Household Words*, was published between 1852 and 1854. *Hard Times* appeared in *Household Words*, and was published in 1854. *Little Dorrit*, commenced in 1856, dealt with imprisonment for debt, the contrasts of character developed by wealth and poverty, and executive imbecility, idealized in the Circumlocution Office.

In 1859, in consequence of a disagreement with his publishers, *All the Year Round* superseded *Household Words* ; and in the first number of this periodical, 28th May, was begun *A Tale of Two Cities*. *Great Expectations* followed in the same paper, on 1st Dec., 1860. In *All the Year Round* also appeared a series of disconnected sketches called *The Uncommercial Traveller*, published in 1868. *Our Mutual Friend* completed in 1865, and published in the usual monthly numbers, with illustrations by Marcus Stone, was the last great serial work which Dickens lived to finish. It contained some studies of characters of a breadth and depth unusual with Dickens, and is distinguished among his works by its elaborate plot.

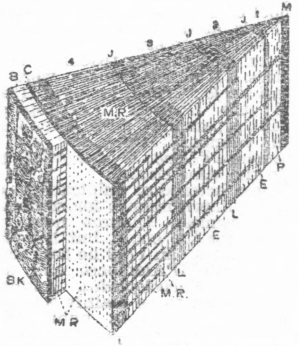
The first number of his last work, *The Mystery of Edwin Drood*, was issued on 1st April, 1870, and only three numbers had appeared when he died somewhat suddenly, at his residence, Gad's Hill Place, near Rochester, on 9th June. He had considerably overtaxed his strength during his later years, more especially by his successive series of public readings from his own works, one series being delivered in America between 1867 and 1868.

He was buried in Westminster Abbey. Dickens's work as a novelist is firmly based upon a wide and keen observation of men. The essence of his art was caricature, and for comic effect he, therefore, often exaggerated the abuses he attacked. His characters exhibit little more than one trait or quality, but the single trait or quality which they embody is truly conceived, and exhibited with great vitality and humour. His creative power was immense, and his great humour is admitted by all, even by those who consider his pathos as overdrawn. In spite, therefore, of all that is grotesque and overstrained in his work, he has been rightly placed amongst the great artists.—BIBLIOGRAPHY : J. Forster, *Life of Charles Dickens* ; George Gissing, *Charles Dickens : a Critical Study* ; G. K. Chesterton, *Charles Dickens* ; R. H. Shepherd, *The Bibliography of Dickens* ; Sir F. T. Marzials, *Life of*

Charles Dickens; E. Pugh, *The Charles Dickens Originals*; P. H. Fitzgerald, *Memoirs of Charles Dickens*.

DICKSONIA. A genus of Leptosporangiate ferns, section Gradatæ, mostly large tree-ferns, such as *D. antarctica*, a native of Australia and New Zealand, often grown in greenhouses.

DICOTYLEDON (dī·kot·i·lē'don). A plant whose seeds are readily recognized by the embryo containing a pair of cotyledons or seed-leaves, which are always opposite to each other. Dicotyledons are further characterized by their netted-veined



Portion of a Four-year-old Dicotyledonous Woody Stem cut in Winter

B, Bast. B.K., Bark external to the first periderm layer, corresponding to the primary cortex. C, Cambium ring. E, Early wood. J, J, J, Junction of the wood of successive years. L, Late wood. M, Medulla. M.R., Medullary rays, various views. P, Protoxylem. 1, 2, 3, 4, The four successive annual rings.

leaves and their "open" vascular bundles containing a cambium; the parts of the flower are commonly in fours or fives. In Bentham and Hooker's system the class is divided into four subclasses—Thalamifloræ, Calycifloræ, Corollifloræ, and Monochlamydeæ. Engler's system recognizes only two subclasses, viz. Archichlamydeæ and Sympetalæ.

DICTAPHONE. An adaptation of the gramophone, in which the principle of that invention is applied to the requirements of modern business. Letters or memoranda are spoken into the machine, which "records" them on waxen cylinders. The machine is then passed on to a shorthand writer or typist (or the cylinder may be transferred to a duplicate machine), and the recorded matter is dictated. The motive power is electricity; the speed of dictation is capable of adjustment to that of the writer; and by means of an accessory machine the records can be scraped and re-used.

DICTA'TOR. An extraordinary magistrate of the Roman Republic, first instituted B.C. 501. The power of naming a dictator, when an emergency arose requiring a concentration of the powers of the State in a single superior officer, was vested by a resolution of the Senate in one of the Consuls. The dictatorship was limited to six months and the person who held it could not go out of Italy. This rule was laid aside during the first Punic War. The dictator was also forbidden to appear in Rome on horseback without the permission of the people, and he had no control over the public funds without the permission of the Senate.

He had the power of life and death, and could punish without appeal to the Senate of people. All the other magistrates were under his orders. Originally the dictator was a patrician, but in 356 B.C. the plebeian Marcius Rutilus was called upon to fill the office of dictator. The term is now often applied to rulers enjoying or exercising extra-constitutional power.—Cf. A. H. J. Greenidge, *Roman Public Life*.

DICTIONARY (from the Lat., *dictio*, a saying, expression, word). A book containing the words, or subjects, which it treats, arranged in alphabetical order. It may be either a vocabulary, or collection of the words in a language, with their definitions; or a special work on one or more branches of science or art prepared on the principle of alphabetical arrangement, such as dictionaries of biography, law, music, medicine, history, or philosophy.

Amongst dictionaries of the English language, the earliest seem to have been those of Bullokar (1616) and Cockeram (1623). That of Dr. Johnson, published in 1755, made an epoch in this department of literature. Previous to this the chief English dictionary was that of Bailey, a useful work in its way. An enlarged edition of Johnson's dictionary, by the Rev. H. J. Todd, appeared in 1818; and this, again enlarged and modified, was issued under the editorship of Dr. R. G. Latham (1864-72).

The best-known American dictionary of the English language is that by Noah Webster, published in 1828, and since entirely recast. Richardson's dictionary, published during 1836 and 1837, was valuable chiefly for its quotations. Ogilvie's *Imperial English Dictionary*, based on

Webster, and first published between 1847 and 1850, has been issued in a remodelled and greatly enlarged form (4 vols. 1881-2 and subsequently, Charles Annandale, LL.D., editor). It is one of the encyclopædic dictionaries. Cassell's *Encyclopædic Dictionary* is an extensive work (1879-88).

One of the largest completed English dictionaries is the *Century Dictionary* (New York, 1889-91, 6 vols. quarto). *The Standard Dictionary* is another American work. *The Oxford English Dictionary* (1884-1928), an English dictionary on historical principles, founded mainly on material collected by the Philological Society, and edited by eminent scholars, is the standard dictionary of the language.

Among foreign dictionaries are the polyglot dictionary of Calepino (1502), the Latin and Greek *Thesaurus* of Robert and Henry Stephanus, the Italian *Vocabulario della Crusca* (1612), etc. The chief etymological dictionary of English words is that by Professor Skeat (1882). Among French dictionaries (for French people) the chief is that of Littré; among German, the dictionary begun by the brothers Grimm.

DICTYOTACEÆ. A family of Brown Algæ, section Cyclosporeæ. *Dictyota dichotoma*, with a delicate, flattened, repeatedly forked thallus, is not uncommon in sandy pools on our coasts. The plants are of three kinds, viz. ♂, bearing antheridia; ♀, bearing oogonia; and neuter, producing tetraspores. The oospores give rise to neuter plants, the tetraspores to ♂ or ♀ plants. This is one of the best instances of "homologous" alternation of generations, i.e. that type in which the different generations are identical in form, differing only in their reproductive organs and in the number of chromosomes in their nuclei. Another genus is Padina.

DIDACTIC POETRY. That kind of poetry which professes to give a kind of systematized instruction on a definite subject or range of subjects. Thus the *Georgics* of Virgil and the *De Rerum Natura* of Lucretius profess to give, the one a complete account of agriculture and kindred arts, the other a philosophical explanation of the world. Other examples of purely didactic poetry are Horace's *Ars Poetica*, and Pope's *Essay on Criticism*.

In a larger sense of the word most great poems might be called didactic, since they contain a didactic element in the shape of history or moral teaching, Dante's *Divina Commedia*, Milton's *Paradise Lost*, or Goethe's *Faust*, for example. The difference may be said to be this, that in the one case the materials are limited and controlled by nothing but the creative fancy of the poet, while in the other they are much more determined by the actual nature of the subject treated of.

DIDEL'PHIA. One of the three sub-classes of the Mammalia (the others being Monodelphia and Ornithodelphia), comprising only one order, that of Marsupials or pouched mammals.

DIDEROT (dēd-rō), **Denis.** A French writer and philosopher, born in 1713, at Langres, in Champagne, died in 1784. He was educated in the school of the Jesuits, and afterwards at Paris, at the College of Harcourt, but declined to study law, preferring to earn his living by teaching mathematics. His first works were the *Essai sur le Mérite et la Vertu* (1745); and the *Pensées Philosophiques* (1746), a pamphlet against the Christian religion. His *Lettre sur les Aveugles à l'Usage de ceux qui Voyent* is in the same strain.

These heterodox publications cost him an imprisonment for some time at Vincennes. Diderot now tried writing for the stage, but his pieces were failures. In 1749 he had begun, along with D'Alembert and some others, the *Encyclopædia*. At first it was intended to be mainly a translation of one already published in English by Chambers. Diderot and D'Alembert, however, enlarged upon this project, and made the new *Encyclopædia* a magnificently comprehensive and bold account of all the thought and science of the time. Diderot, besides revising the whole, undertook at first the mechanical arts, and subsequently made contributions in history, philosophy, and art criticism. But the profits of all his labour were small, and it was only the liberality of the Empress Catherine, who purchased his library for 50,000 livres and made him a yearly allowance of 1000 livres, that saved Diderot from indigence.

In 1773 he visited St. Petersburg to thank his benefactress and was received with great honour. On his return to France he lived in retirement, passing the last ten years of his life in writing and conversations, wherein, as Marmontel said, he was at his best. Besides his articles in the *Encyclopædia* he wrote numerous works, some of which were published after his death. Among the best known are *Le Neveu de Rameau*, a kind of philosophical dialogue which Goethe thought worthy of translation; *Essai sur la Peinture*, and

Paradoxe sur le Comédien, suggestive essays on the principles of painting and acting; two lively tales, *La Religieuse* and *Jacques le Fataliste*. On account of his great interest in almost every branch of human knowledge, Voltaire nicknamed him "Pantophile Diderot."—BIBLIOGRAPHY: T. Carlyle, *Essay on Diderot*; F. Brunetière, *Études Critiques*; R. L. Cru, *Diderot as a Disciple of English Thought*.

DIDO, or **ELISSA.** The reputed founder of Carthage. She was the daughter of a king of Tyre, called by some Belus, by others Metten or Matgenus. After her father's death, her brother Pygmalion murdered her husband Sicharbas, or as Virgil calls him Sychæus, with the view of obtaining his wealth. But Dido, accompanied by many Tyrians of her party, fled with all the treasure over sea, and, landing on the coast of Africa, founded Carthage about 860 B.C. The story is told by Virgil, with many inventions of his own, in the *Æneid* (Books i. and ii.).

DIDOT (dē-dō). A famous house of printers, booksellers, and type founders at Paris. The founder was **François Didot,** born in 1689, died 1757. Of his sons **François-Ambroise** (born 1720, died 1804) and **Pierre-François** (born 1732, died 1795) the first distinguished himself in the type-founding art as an inventor of new processes and machines, the second was equally eminent for his bibliographical knowledge, and contributed much also to the advancement of printing.—**Pierre** (born 1761, died 1853) succeeded his father François-Ambroise in the printing business. He made himself famous by his magnificent editions of classic authors in folio, amongst which his Virgil (1798) and his Racine (1801) may be particularly mentioned. He did much also for the improvement of types. He is known also as an author.—**Firmin** (born 1764, died 1836), the brother of Pierre, took charge of the type-founding, was the inventor of a new sort of Script, and an improver of the stereotype process.

Ambroise-Firmin (born 1790, died 1876), and **Hyacinthe-Firmin** (born 1794, died 1880) occupied a distinguished position amongst the publishers of Paris. The former left a collection of MSS. which was worth, at the time of his death, about two million francs. The house has now extended its trade into everything connected with bookselling, paper-making, and book-binding.

DIDSBURY. A district of Manchester, on the Midland Railway, 4 miles south by east of Manchester, a place of residence of many Manchester business men. There is an important Wesleyan Training College there.

DIDUN'CULUS. A genus of birds allied to the pigeons, and comprising only the one species, *D. strigirostris*, native to some of the Samoan Islands. This bird is of special interest as being the nearest living ally of the extinct dodo. It has a length of about 14 inches, with a glossy plumage verging from a velvety black on the back to greenish black on the head, breast, and abdomen. The large beak, which is nearly as long as the head, is greatly arched on the upper half, while the lower is furnished with two or three tooth-like indentations.

DIDYM'IUM. A rare metallic element, occurring along with *lanthanum* in the mineral cerite as discovered by Mosander in 1842. It has been resolved into two new elements: *Praseodymium* (Pr., 140·9) and *Neodymium* (Nd., 144·3).

DIE. A metallic stamp for impressing a design or figure upon coins or other metallic objects. *See* DIES AND DIE-SINKING.

DIE (dē). An ancient town, France, department of Drôme, 26 miles south-east of Valence; with an ancient cathedral and Roman remains. Pop. 4000.

DIÉ (di-ā), **St.** A town, France, department of Vosges, on the Meurthe, 25 miles E.N.E. of Epinal. Both iron and copper are worked; there are marble quarries, and numerous manufactures are carried on. Pop. 19,695.

DIEBITSCH - SABALKANSKI, Hans Karl. A Russian general, born at Grossleippe, in Silesia, in 1785, died 9th June, 1831. He was educated at the military school of Berlin, but in 1801 quitted the Prussian service for that of Russia. He was present at the battles of Austerlitz and Friedland, served with distinction in the campaign of 1812, took part in the battles of Dresden and Leipzig, and was made lieutenant-general at the age of twenty-eight.

He had the chief command in the Turkish War of 1828-9, stormed Varna, and made the famous passage of the Balkans, for which the surname of Sabalkanski was conferred on him. In 1830 he commanded the army sent against the revolted Poles, but did not distinguish himself in this service.—Cf. Bantych-Kamenski, *Biographies of Russian Field-Marshals*.

DIEFFENBACH (dē'fen-bâh), **Johann Friedrich.** German surgeon, born at Königsberg in 1792, died in

1847. After having studied at Bonn and Paris, he settled in Berlin, where his talent as an operator soon attracted notice. Surgery is particularly indebted to him for new methods of forming artificial noses, eyelids, and lips, and curing squinting and stammering.

DIEGO GARCIA. *See* CHAGOS.

DI'ELECTRIC. In electricity, a name applied by Faraday to any medium through or across which electrostatic induction can take place. *See* ELECTRICITY (Electrostatics). Faraday first showed that electrostatic induction was not action at a distance, but took place by means of the insulating medium separating the two conductors. The medium he named a *dielectric*, and measured its specific inductive capacity by taking that of common air as unity.

DIËLY'TRA, or DICENTRA. A genus of plants of the nat. ord. Fumariaceæ or Fumitories. The best known is *D. spectabilis*, a native of Northern China and Siberia, now common in European and other gardens. It blossoms in April and May, and its long drooping racemes of purplish-red blossoms present a very graceful appearance. It grows freely in the open air. It is sometimes called bleeding heart or virgin's heart from the shape of the blossoms.

DIEMEN (dē'men), **Anton van.** Dutch administrator, was born in 1593, died in 1645. Having gone to India, he speedily rose to the highest dignities, and was at length, in 1636, made Governor-general. He administered the government with much ability, and contributed much to the establishment of Dutch commerce in India. Abel Tasman, whom he sent with a vessel to the South Seas in 1642, gave the name of *Van Diemen's Land* to the island now called Tasmania.

DIEPPE (dē-ep'). A seaport town, France, department of Seine-Inférieure, on the English Channel, at the embouchure of the Arques, 93 miles N.N.W. of Paris. Almost the only public edifices worth special notice are the two Gothic churches, St. Jacques, begun in the thirteenth century, and St. Rémi, founded in 1522, and the old castle (1433), now a barracks.

To the west of Dieppe proper is the suburb La Barre; and on the opposite side of the harbour Le Pollet, inhabited chiefly by sailors and fishermen. The old port is spacious, but a new channel with its own harbour system has been added, and vessels of 20-foot draft can now enter. Dieppe is one of the chief watering-places of France, and is much frequented by visitors in summer and autumn. The great bathing establishment forms a luxurious retreat for bathers and invalids, and includes a ballroom.

The manufactures include works in ivory, horn, and bone, lace-making, sugar-refining, and shipbuilding. There is a busy fishery, and the foreign trade is still considerable. There is constant steam intercourse between this port and Newhaven. In early times Dieppe was the chief port of France, but its prosperity diminished after the revocation of the Edict of Nantes (1685). During the European War Dieppe was an important Allied base. Pop. 25,117.

DIERX, Léon. French poet, born in the Island of Réunion in 1838. Educated in Paris, he became one of the foremost of the Parnassians. His works include: *Aspirations*, *Poèmes et Poésies*, *La Rencontre*, and *Les Amants*. His collected poems (1889-90) were crowned by the Académie. He died in Paris, 11th June, 1912.

DIES AND DIE-SINKING. Die-sinking is the art of preparing dies; a die being a plate or block, usually of metal, so cut or shaped as to be capable, by means of stamping or pressure, of transferring a given design to some article which is to be manufactured in quantity. The pressure may be applied by any sort of power, from hand to hydraulic.

The steel for the manufacture of steel dies is carefully selected, forged at a high heat into the rough die, softened by careful annealing, and then handed over to the engraver. After the engraver has worked out the design in intaglio, the die is put through the operation of hardening, after which, being cleaned and polished, it is called a *matrix*. This is not, however, generally employed in multiplying impressions, but is used for making a *punch* or steel impression for relief. For this purpose another block of steel of the same quality is selected, and, being carefully annealed or softened, is compressed by proper machinery upon the matrix till it receives the impression. When this process is complete, the impression is retouched by the engraver, and hardened and collared like the matrix. Any number of dies may now be made from this punch by impressing upon it plugs of soft steel.

There is hardly any article which does not in the course of its manufacture require the use of a die of some kind. For all sorts of metal-work, seals, rings, silverware, moulds

and shapes of sheet steel or tin, dies are employed. For this class of work they are usually of steel. For embossing articles of leather, wood, celluloid, rubber, cloth, or clay, dies of brass and phosphor-bronze are commonly used, these being easier media to work in and yet sufficiently strong. The dies for letter headings and company seals are cut, in reverse to the design required, in steel; those for sealing-wax seals in steel or brass; the lettering being usually punched in by hand by separate letter punches, which themselves have been cut in relief on steel.

Designs which are unusually ornate may be engraved by hand. Dies for embossing designs on leather, catalogue covers, cardboard articles, cards and soft materials are usually modelled in brass. The design in reverse is cut out to a depth corresponding to the relief wanted. These dies are usually worked up by hand by the engraver. Dies for the reproduction of rubber stamps for printing on clay are cut in phosphor-bronze or hard brass in relief and reverse, and with an extreme bevel. The dies or blocks are then struck deeply into lead, and melted rubber is poured into the moulds so formed. When set, the rubber is removed and mounted as a hard-stamp ready to impress the clay in ink. Dies for wall-papers are cut on rollers. Steel dies for flower-shapes have a cutting edge, so that they can stamp out and emboss in one action.

Of late years machinery has come much into use for relieving the engraver of some of his labour, but the designs are generally kept secret. One machine, called the pantograph or engraving machine, reproduces engravings in all metals and many shapes from patterns. Many of the stamp-duty steel dies made and issued by the Royal Mint are reproduced from this machine in reductions from brass patterns. — BIBLIOGRAPHY: Lucas, *Dies and Die-making*; J. V. Woodworth, *Dies: their Construction and Use.*

DIESEL, Rudolph. German inventor, born in Paris in 1858, died in 1913. Educated in England and at Munich, he proposed in 1893 to utilize directly the energy created by the combustion of fuel, a proposal which led to his invention of the Diesel engine. (*See* INTERNAL COMBUSTION ENGINES.) In 1913 he was called to England to consult with the Admiralty on the application of his motor, but was drowned in crossing the Channel. In 1894 he published a monograph entitled *Theory and Construction of a Rational Heat Motor.*

DIES FASTI ET NEFASTI. A Roman division of days, with reference to judicial business, into working-days and holidays. A *dies fastus* was a day on which courts and assemblies could be held and judgments pronounced; a *dies nefastus*, a day on which courts could not be held nor judgments pronounced.

DIES IRÆ (di'es ĭ'rē). One of the great Latin hymns of the Mediæval Church, generally used as part of the requiem or mass for the souls of the dead. It describes, as its name ("the day of wrath") denotes, the Last Judgment of the world, and seems to have been suggested by the description in Zephaniah i. 15 and 16. It is supposed to have been written by Thomas da Celano, a Franciscan friar of the thirteenth century. It was translated by Crashaw and Dryden in the seventeenth century, and by Macaulay and others in the nineteenth, but none of these translations conveys the solemn force of the original.

DIEST (dēst). A town, Belgium, province of Brabant, 32 miles E.N.E. of Brussels. It has some manufactures, but the chief products of the place are beer and gin, the former being largely exported. The town was occupied by the Germans in 1914, and re-entered by the Belgians in 1918. Pop. 8800.

DIESTERWEG, Friedrich Adolf Wilhelm. German educator, born in 1790, died in 1866. In 1820 he became director of the new Teachers' Seminary at Mörs, and soon gained a reputation as teacher and educator. He was a follower of Pestalozzi, and aimed at making every subject of instruction a means of education. In 1827 he founded the *Rheinische Blätter für Erziehung und Unterricht*, wherein he advocated his pedagogical views.

DI'ET. A meeting of some body of men held for deliberation or other purposes; a term especially applied to the legislative or administrative assemblies of Austria, Germany, and Poland.

DIETET'ICS (Gr. *diaita*, daily regimen). That part of medicine which relates to the regulation of diet. The ideal diet is clearly that which, without burdening the viscera uselessly, furnishes all necessary nutritive elements, with due consideration for special physiological conditions in any given case. Under the head of *Aliment* the physiological properties of various foods have already been considered theoretically in respect of their capacity to supply physical waste in nitrogenous and non-nitrogenous matter. (*See* ALIMENT.)

No single substance contains the elements needed to replace this waste in their requisite proportions, and a mixed diet is therefore necessary. For instance, to secure the required amount of carbon a man would need to eat about 4 lb. of lean beef, while 1 lb. would yield all the nitrogen required; thus, apart from the labour of digesting 4 lb. of beef, the body would be compelled to get rid of the excess of nitrogen. Bread, on the other hand, has carbon in abundance, but is deficient in nitrogen; so that by uniting 2 lb. of bread with ¾ lb. of lean meat, the due proportion of carbon and nitrogen is satisfactorily supplied. Milk and oatmeal taken together also contain nitrogenous and non-nitrogenous substances in nearly the required proportions. A certain proportion of saline matter is also necessary.

The nature of the food most suitable for a healthy man is dependent in part upon general conditions, such as climate and season, and in part upon special conditions of individual habit. The inhabitants of the Arctic regions need large quantities of oleaginous food; those of the Tropics live chiefly on starchy products. With increased activity and exertion, as in training, an increase in the nitrogenous foods becomes necessary. In a state of health we need not draw hairbreadth distinctions as to the superior salubrity of the several sorts of diet, the quantity rather than the quality of food being the main consideration. Those persons who have been most remarkable for health and long life have generally been contented with two moderate meals a day, which are certainly quite sufficient during a state of health.

In various countries the breakfast generally consists of tea, coffee, or cocoa, with a certain proportion of bread and butter; persons with delicate digestive powers, or who lead a sedentary life, cannot with safety or comfort eat animal food *constantly* to breakfast. At dinner all made-dishes highly spiced, such as curries, turtle-soup, etc., as provoking appetite, are hurtful; and the custom of late dining is not to be commended. Stewed and boiled meats are more difficult to digest than meat cooked by fire alone. The flesh of young animals seems to be more difficult of digestion than that of old; and the flesh of tame than that of wild animals. All sorts of fat meat must be taken in smaller quantities. Hence, also, ham, bacon, and salted meats cannot be eaten in such quantities as the tender flesh of poultry. Fish has the advantage of being easily soluble.

All boiled vegetables are in general easy of digestion; raw vegetables and salads are rather more difficult. Fruit should be taken in the forenoon rather than after a hearty meal. The moderate use of fermented liquors is far from being invariably an evil, but the smaller the quantity habitually used the better in the majority of cases.

In all diseases attended with much fever or quickness of pulse the stomach loathes animal food, and there is generally a great increase of thirst, to quench which water, either quite cold, or iced, or tepid, or rendered acid, may be freely indulged. Infusions, too, of barley, sage, balm, etc., may be taken. In chronic diseases attended with hectic fever, milk is the most proper diet.

The best food for infants is, of course, their mother's milk; but whenever they begin to cut teeth a little animal food, such as soft-boiled eggs, beef-tea, and even chicken minced very fine, may be given. Many infants suffer from having too much sugar given them in their food.—

BIBLIOGRAPHY: R. H. Chittenden, *Physiological Economy in Nutrition*, and *Nutrition of Man*; Hutchison, *Food and Dietetics*; Lusk, *The Science of Nutrition*.

DIETRICH (dē'trih), **Christian Wilhelm Ernst.** A German painter and engraver, born in 1712, died in 1774. He studied under his father, and afterwards under Alexander Thiele at Dresden, where he became court-painter and professor in the academy. He adopted several different manners, successfully imitating Raphael and Mieris, Correggio, and Ostade.

DIETRICH OF BERN (dē'trih). The name under which Theodoric the Great, King of the Ostrogoths, appears in the old German legends. Bern stands for Verona, his capital.

DIEU, or **D'YEU** (dyeu; ancient **INSULA DEI**). An island off the west coast of France, department of Vendée. It is inaccessible on the west side, but on the east has a tolerable harbour defended by batteries. The chief industry is fishing. There are four lighthouses on the island. Pop. 3809.

DIEU ET MON DROIT (dyeu e mon drwä; "God and my right"). The battle-cry of Richard I. at the battle of Gisors (1198), signifying that he was not subject to France, but owed his power to God alone. The battle-cry was then adopted as the motto of the arms of England, and revived by Edward III. in 1340, when he claimed the crown of France. Except during the reigns of Elizabeth and Anne, who used the motto *Semper eadem*, and of William III., who personally used *Je*

maintiendray, it has ever since been the royal motto of England.

DIEZ (dēts), **Friedrich Christian.** German philologist of the Romance languages, born in 1794, died in 1876. Having qualified himself as a lecturer at Bonn, he was appointed professor of the Romance languages there in 1830. His work stands in much the same relation to the Romance dialects which the researches of Grimm occupy with respect to German dialects. In addition to various works on the poetry of the Troubadours, he published a very valuable *Grammatik der Romanischen Sprachen* (1836-42, translated into English by Cayley in 1863), and an *Etymologisches Wörterbuch der Romanischen Sprachen* (1853).

DIFFERENCE. A stock exchange term. When stock is bought or sold merely as a speculation for the rise or fall, with no intention of the buyer to "take up" the stock, or of the seller to deliver it, the "difference" is the movement in price which may take place between the date of the transaction and the following "settling day." If the price falls, the buyer has to pay the difference upon "carrying over" his purchase to the next account; if it rises, the seller is at the loss. Since the first weeks of the European War all stock exchange transactions have been made, in theory at least, for cash, and speculative business of this nature has been consequently much reduced.

DIFFERENCES, Finite. A calculus much used in actuarial work, which deals with a series of numbers by considering the differences of the successive terms.

If $u_1, u_2, u_3, \ldots$ are the terms of the series, then u_2-u_1, u_3-u_2, u_4-u_3, . . . form another series called the series of first differences. The notation used is $u_2-u_1=\Delta u_1$, $u_3-u_2=\Delta u_2, \ldots$

These first differences may themselves be differenced, giving the second differences $\Delta u_2-\Delta u_1$, $\Delta u_3-\Delta u_2, \ldots$, which are written $\Delta^2 u_1$, $\Delta^2 u_2, \ldots$

Similarly, we form the third differences $\Delta^3 u_1=\Delta^2 u_2-\Delta^2 u_1$, and so on.

As an example, let the original series be the cubes of the natural numbers.

1	8	27	64	125	216	343	512
7	19	37	61	91	127	169	
12	18	24	30	36	42		
6	6	6	6	6			
0	0	0	0				

Here we begin by writing down the series of cubes as far, say, as 216; beneath these we write the first differences $8-1=7$, $27-8=19$, etc. We thus obtain the part of the table to the left of the diagonal line.

We observe that the third differences are constant, each being 6. (It is easy to prove generally that the nth differences of the series, 1^n, 2^n, $3^n, \ldots$, are constant.) Knowing the third differences, we can now extend the table as far as we wish to the right of the diagonal line. We get first $6+30=36$, $36+91=127$, $127+216=343$. We infer that $7^3=343$.

Since $u_1-u_0=\Delta u_0$, we have $u_1=u_0+\Delta u_0=(1+\Delta)u_0$.

Similarly, $u_2=(1+\Delta)u_1=(1+\Delta)^2 u_0$; and, generally,

$$u_x=(1+\Delta)^x u_0$$
$$=\left\{1+x\Delta+\frac{x(x-1)}{1\cdot 2}\Delta^2+\ldots\right\}u_0$$
$$=u_0+x\Delta u_0+\frac{x(x-1)}{1\cdot 2}\Delta^2 u_0+\ldots,$$

a formula much used by calculators, and known as Newton's interpolation formula.

The above symbolic method of proof only applies when x is a positive integer, but the result is used in practice even for fractional values of x, as in most cases the high differences become negligible.

If n is a positive integer, it is easy to prove that

$$\Delta^n u_x=u_{x+n}-nu_{x+n-1}+\frac{n(n-1)}{1\cdot 2}u_{x+n-2}-\ldots$$

If the nth differences vanish, or are negligible, this gives

$$0=u_{x+n}-nu_{x+n-1}+n\frac{(n-1)}{1\cdot 2}u_{x+n-2}-\ldots+(-1)^n u_x,$$

another useful interpolation formula, by which we can calculate any missing term of a series.—BIBLIOGRAPHY: G. Goole, *Finite differences*; *Textbook of the Institute of Actuaries*.

DIFFERENTIAL EQUATION. An algebraical relation involving derivatives or differentials. Examples:

$$\frac{d^2z}{dt^2}=g;\quad ydx+xdy+zdz=0.$$

An *ordinary* differential equation involves only one independent variable, a *partial* differential equation involves more than one. Examples of ordinary equations:

$$\frac{d^2y}{dx^2}+\frac{1}{x}\frac{dy}{dx}+y=0;$$
$$\frac{d^2x}{dt^2}+a\frac{dy}{dt}+px+qy=0.$$

Examples of partial differential equations:

$$x\frac{dz}{dx}+y\frac{dz}{dy}=nz\,;\quad \frac{d^2u}{dx^2}+\frac{d^2u}{dy^2}+\frac{d^2u}{dz^2}=0.$$

Equations, whether ordinary or partial, can also be classified as *linear* or *non-linear*. A linear equation is a rational integral equation of the first degree in the dependent variable or variables and their derivatives. The equation

$$x^2\frac{d^2y}{dx^2}+x\frac{dy}{dx}+(x^2+1)y=0.$$

is linear, but

$$\left(\frac{dy}{dx}\right)^2=xy \text{ and } y\frac{dy}{dx}=x^2$$

are non-linear. The *order* of an equation is the order of the highest derivative or differential which it contains. Of the three equations last written, the first is *linear of the second order*, the other two are of the *first order and second degree*. To *integrate* a differential equation or system of equation is to find a relation or relations among the variables, equivalent to the given equation or equations. Thus the integral of

$$\frac{d^2z}{dt^2}=g \text{ is } z=\tfrac{1}{2}gt^2+At+B,$$

where A and B are *arbitrary constants*. An ordinary equation of the nth order with one dependent variable has exactly n arbitrary constants in its complete integral, or solution. In a practical problem the arbitrary constants are determined by the *initial*, or *boundary conditions*. The solution of $\frac{d^2z}{dt^2}=g$, e.g. is completely determinate if the values of z and $\frac{dz}{dt}$ when $t=0$ are given. The solution of *partial* equations may involve arbitrary *functions*, which become definite when proper initial or boundary conditions are assigned. Thus the equation $\frac{du}{dx}=\frac{du}{dt}$ has for its complete solution $u=\varphi(x+t)$, where φ may be a function of any form whatever; if now we are given that, when $t=0$, $u=$a given function $f(x)$, we obtain $f(x)=\varphi(x)$, so that the solution required is $u=f(x+t)$. Certain ordinary linear equations of the second order are specially important, both from the beauty of their theory and from their usefulness in Mathematical Physics. Some of these equations are: Bessel's equation, Legendre's equation, the hypergeometric equation, Mathieu's equation, Lamé's equation. Linear partial equations of the second order are fundamental in Physics. Such are: Laplace's equation,

$$\frac{d^2V}{dx^2}+\frac{d^2V}{dy^2}+\frac{d^2V}{dz^2}=0\,;$$

the wave equation,

$$\frac{d^2V}{dt^2}=c^2\left(\frac{d^2V}{dz^2}+\frac{d^2V}{dy^2}+\frac{d^2V}{dz^2}\right);$$

the equation of conduction of heat,

$$\frac{dV}{dt}=k\left(\frac{d^2V}{dx^2}+\frac{d^2V}{dy^2}+\frac{d^2V}{dz^2}\right).$$

These involve one dependent variable only. Equations with several dependent variables occur in Elasticity, Electrodynmaics, and Hydrodynamics. A notable feature of the hydrodynamical equations is that they are not linear.

No general rules exist enabling us to deal with a differential equation taken at random, and only a few types have been completely solved. Of soluble equations, the most important are those which are *linear with constant co-efficients*.

Example 1. $\frac{d^2x}{dt^2}-7\frac{dx}{dt}+12=0$. To solve this, try $x=e^{mt}$. We find $e^{mt}(m^2-7m+12)=0$. Thus $m=3$ or 4. It is now easy to show that $x=Ae^{3t}+Be^{3t}$ is a solution, where A and B are arbitrary constants. This is the general solution. We can determine A and B if the values of x and $\frac{dx}{dt}$ are given for a definite value of t, say $t=0$.

Example 2. $\frac{d^2y}{dt^2}=c^2\frac{d^2y}{dx^2}$. Try $y=e^{lx+wt}$. We find $m^2=c^2l^2$, or $m=\pm cl$. Hence $y=Ae^{l(x+ct)}+Be^{l(x-ct)}$ is a solution for all values of A, B, l; so, also, is the sum of any number of terms of similar forms. We may infer that the general solution is

$$y=f(x+ct)+\mathrm{F}(x-ct),\ \text{D}$$

where f and F are arbitrary functions. It is only in exceptional cases that an equation can be solved, as in these two examples, by an analytical formula; indeed, differential equations are the most fertile source of new functions in analysis. But, as in the analogous cases of algebraic equations and definite integrals, it may be quite possible to find, by methods of approximation, an arithmetical solution which is sufficient for the purpose in hand.—BIBLIOGRAPHY: H. T. H. Piaggio, *Differential Equations*; J. M. Page, *Ordinary Differential Equations*; A. R. Forsyth, *A Treatise on Differential Equations*; E. T. Whittaker and G. N. Watson, *Modern Analysis*.

IFFRAC'TION. A term applied to bending that rays of light undergo passing close to the edge of an que body. Thus when a beam of ct sunlight is admitted into a dark m through a narrow slit, and falls n a screen placed to receive it re appears a line of white light dered by coloured fringes; these ges are produced by diffraction, l in the case given it may be seen t the red or long-wave rays are tracted more than the blue rays. INTERFERENCE.

IFFU'SION. The gradual mixing gases, liquids, or solids when ught into direct contact. When a ck of lead is placed on a block of d, with their smooth surfaces in se contact, it is found that, after eral weeks, gold has diffused into lead, and lead into the gold. In case of gases, when a jar of ygen and a jar of hydrogen are con-cted together by a tube or opening any kind, they rapidly become xed; and their mixture does not pend on gravity, but takes place in position to that force, as may be own by placing the jar of hydrogen s above the other.

Oxygen is sixteen times heavier an hydrogen, bulk for bulk, but the avier gas moves upwards and the hter downwards, and the process intermixture, or *diffusion*, goes on l the two gases are apparently uably distributed throughout the hole space. After that they have no ndency whatever to separate. milarly, if two vessels, one contain-g oxygen and the other hydrogen, connected by a tube which is uffed with a plug of porous material, ch as plaster of Paris, the gases adually diffuse one into the other rough the porous plug. The two ases, however, do not pass through e porous separator at equa rates, t in *inverse proportion to the square ots of the densities of the gases.*

Thus in the case of two vessels, one ntaining hydrogen and the other xygen, which is sixteen times as eavy as hydrogen, the hydrogen will ass towards the oxygen jar four mes as quickly as the oxygen will ass towards the hydrogen jar. indred phenomena occur when two quids tha are capable of mixing, uch as alcohol and water, are put in ontact, the two gradually diffusing ne into the other in spite of the ction of gravity.

In some cases, however, as where ther and water are employed, the iffusion is only partial, this result rising from the fact that these two quids are not miscible in all propor-ions. When solutions of various solid bodies are placed in contact, inter-diffusion also takes place. On the results of his examination of the phenomena of diffusion of liquids and salts across porous membranes or *septa*, Graham founded a method of separating *colloid* from *crystalloid* bodies, which he called *dialysis*.

DIGAM'MA. A letter which once belonged to the Greek alphabet, and which remained longest in use among the Æolians. It resembled our letter F, and hence was called *digamma*, that is, double Γ. It appears to have had the force of *f* or *v*. Its existence was first pointed out by Richard Bentley.

DIGBY, Sir Everard. An English gentleman, born of a Roman Catholic family in 1578. He enjoyed some consideration at the court of Elizabeth and James I., by whom he was knighted. Having contributed money to the Guy Fawkes conspiracy, he was tried and hanged in 1606.

DIGBY, Sir Kenelm. Eldest son of the preceding, born in 1603, died in 1665. He studied at Oxford, was knighted in 1623, and on the accession of Charles I. was created a gentleman of the bed-chamber, a Commissioner of the Navy, and a governor of Trinity House. He soon after fitted out at his own expense a small but successful squadron against the French and Venetians. In 1636 he became a Roman Catholic, and was imprisoned as a Royalist during 1642-3, when he was allowed to retire to the Continent. At the Restoration he returned to England, became a member of the Royal Society, and was much visited by men of science. He wrote numerous works: a *Treatise on the Nature of Bodies*, a *Treatise on the Nature and Operation of the Soul*, and *Of the Cure of Wounds by the Powder of Sympathy*.

DI'GEST. A name originally given to a collection or body of Roman laws, digested or arranged under proper titles by order of the Emperor Justinian. Hence applied to any somewhat similar collection.

DIGES'TER. A strong vessel of copper or iron on which is screwed an air-tight cover with a safety-valve, the object being to prevent loss of heat by evaporation, and to enable boiling to take place at a high pressure. Water may be thus heated to 400° F.; at which temperature its solvent power is so greatly increased that bones are converted into a jelly.

DIGES'TION. Is that process in the animal body by which the aliments are so acted upon that the nutritive parts are prepared to enter the circulation, and separated from those which

cannot afford nourishment to the body. The organs effecting this process are called the *digestive organs*, and consist of the stomach, the great and small intestines, etc. (*see* INTESTINE, STOMACH), the liver, and pancreas. When the aliments, after being properly prepared and mixed with saliva by mastication, have reached the stomach, they are intimately united with a liquid substance called the *gastric juice*, by the motion of the stomach. By this motion the aliments are mechanically separated into their smallest parts, penetrated by the gastric juice, and transformed into a uniform pulpy or fluid mass.

The gastric juice acts upon the albuminous parts of the food, converting them into peptones, which can pass through organic membranes and thus enter the blood. This action is aided by the warmth of the stomach. The pulpy mass, called *chyme*, proceeds from the stomach, through the pylorus, into that part of the intestinal canal called the small intestine, where it is mixed with the pancreatic juice, bile, and intestinal juice.

The pancreatic juice converts starch into sugar, albumins into peptones, and emulsionizes fats, so that all these kinds of food are rendered capable of absorption. The process is aided by the intestinal juice. The bile also acts upon fats, and thus the food is formed into the *chyle*, which is absorbed into the system by the capillary vessels called *lacteals* (*see* CHYLE; CHYME), while the non-nutritious matters pass down the intestinal canal and are carried off.—BIBLIOGRAPHY: F. Hare, *Food Factor in Disease*; Taylor, *Digestion and Metabolism*.

DIGIT (dij'it; Lat. *digitus*, a finger). In arithmetic, any one of the ten numerals, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. Digit is also a measure of a finger's breadth, equal to ¾ inch.

DIGIT. In astronomy, is the measure by which we estimate the quantity of an eclipse. The diameter of the sun or moon's disc is conceived to be divided into twelve equal parts, called *digits*; and according to the number of those parts or digits which are obscured, so many digits are said to be eclipsed.

DIGITALIN (dij-i-tā'lin). A vegetable alkaloid, the active principle of the *Digitālis purpurea* or foxglove. It has a bitter taste, and is a strong poison, but is used medicinally, especially for the heart. *See next article.*

DIGITA'LIS (dij-). A genus of plants, nat. ord. Scrophulariaceæ, containing about twenty species tall herbs, natives of Europe Western Asia. The purple foxgl (*D. purpurea*) is a common v flower in Britain, and several spe are grown in gardens. Various parations from the foxglove rece this name, and are used in medici principally in cases of heart disea

DIGITIGRA'DA (*digitus*, fing toe, and *gradi*, to walk). A section the Carnivora, so called from th walking on the ends of their toes; the dog, cat, and their allies. PLANTIGRADE.

DIGITO'RIUM. A small porta dumb instrument having a sh keyboard with five keys like those a piano, used by piano-players practice, to give strength a flexibility to the fingers.

DIGNE (dēny). A town, Fran capital of the department of Bass Alpes, picturesquely situated on mountain slope, 60 miles north-ea of Marseilles. In 1629 a plague duced the population from 20,000 1500. Pop. 7317.

DIJON (dē-zhōn; Lat. *Castra Divonense*). A town in Easte France, capital of the department Côte-d'Or, in a fertile plain, at t foot of a range of vine-clad slope formerly surrounded by rampart which now furnish beautiful pr menades. At some distance it surrounded by a series of forts.

Some of the buildings belong to t period when Dijon was capital of t dukedom of Burgundy, the chief bei the cathedral of St. Bénigne, a buil ing of vast extent with a lofty woode spire above 300 feet high; t churches of Nôtre Dame and S Michael; the ancient palace of t Dukes of Burgundy, now used as t hôtel de ville and museum; and t *palais de justice*, formerly the Parli ment House of Burgundy. Dijon the birth-place of Bossuet. It h important educational institutio and a valuable library. Industries woollens, hosiery, candles, mustar vinegar, chemicals, paper-hanging tanneries, foundries, machine fa tories, cotton- and oil-mills. Th trade is considerable, particularly i the wines of Burgundy. Pop. 90,86

DIKE, or **DYKE** (connected wit the Gr. *teichos*, wall). A word variousl used in different localities to represen a ditch or trench, and also an em bankment, rampart, or wall. It i specially applied to an embankmen raised to oppose the incursions of th sea or of a river, the dikes of Hollan being notable examples of work c this kind. These are often raised 4 feet above the high-water mark, an

are wide enough at the top for a common roadway or canal, sometimes for both. The Helder Dike, one of the largest, is about 6 miles in length and costly in upkeep. *See* EMBANKMENT.

DIKE, or **DYKE.** In geology, a term applied to intrusive igneous masses, such as basalt, which fill up veins and fissures in the other rocks, and sometimes project on the surface-like walls through their superior resistance to weathering.

DILAPIDATION. In English ecclesiastical law, is where an incumbent of a church living suffers the parsonage-house or outhouses to fall down, or be in decay for want of necessary repairs; or it is the pulling down or destroying any of the houses or buildings belonging to a spiritual living, or destroying of the woods, trees, etc., appertaining to the same. An outgoing incumbent (or his heirs) is liable for dilapidation to his successor. In general, the term is applied to the act of allowing or causing any lands, houses, etc., to become waste or to decay.

DILEM'MA (from Gr. *di-*, double, and *lēmma*, proposition, assumption). In logic, a form of argument used to prove the falsehood or absurdity of some assertion, as in the following instance: If he did so he must be either foolish or wicked; but we know he is neither foolish nor wicked; therefore he cannot have done so. The two suppositions, which are equally untenable, are called the "horns" of the dilemma.

DILETTANTE (di-let-tän'tā). An Italian expression, signifying a lover of the arts and sciences, who devotes his leisure to them as a means of amusement and gratification, being thus nearly equivalent to *amateur*. It is also used in reference to the trifler and dabbler in art and science. In 1734 a number of gentlemen founded in London a Dilettanti Society, which published a splendid work on *Ionian Antiquities*, 1769-1881 (4 vols.); *Specimens of Ancient Sculpture*, 1809, 1835.

DILIGENCE. Form of stage coach. It was popular in France until superseded by steam trains, and lingered throughout the 19th century in Switzerland and other mountain regions.

DILKE, Sir Charles Wentworth. English writer and politician, son and grandson of men well known in their day, was born in 1843, died in 1911. He graduated at Cambridge, and was called to the Bar. His first work, *Greater Britain*, the result of a tour round the world from 1866 to 1867, became very popular.

In 1868 he was elected member of Parliament for Chelsea, and he remained so up to 1885. After a few years' retirement (due to a divorce case) he became member of Parliament for Forest of Dean. He was Under-Secretary for Foreign Affairs, President of the Local Government Board, etc. He succeeded his father as owner of the *Athenæum*, and became the proprietor of *Notes and Queries*. *The Present Position of European Politics*, and *Problems of Greater Britain*, are among his works.

DILL. An umbelliferous plant, *Anēthum graveōlens*, a native of the southern countries of Europe, the fruits, commonly but erroneously called seeds, of which are moderately warming, pungent, and aromatic, and are employed medicinally as a carminative.

DILLENIA'CEÆ. An order of plants, chiefly fine trees, inhabiting the East Indies, allied to Ranunculaceæ and Magnoliaceæ.

DILLINGEN (dil'ing-en). An old town, Bavaria, on the Danube, formerly the seat of a Jesuit university. Pop. 6291.

DILLON, John. Irish politician and agitator, born in Dublin in 1851, the son of John Blake Dillon (1816-66), a leader of the Young Ireland party. Educated at the Catholic University of Dublin and at the Royal College of Surgeons, he became a doctor of medicine. He identified himself with the Parnellite movement, and entered Parliament for Tipperary in 1880.

An ardent Nationalist, not hesitating to incite his compatriots to lawlessness, he was sent to prison in 1888. Without a seat in Parliament from 1883 to 1885, he was returned in the latter year for East Mayo, which he represented thereafter. In 1918, after the death of John Redmond, he was elected chairman of the Irish Nationalist party, which, however, owing to the rise of the Sinn Fein party, was a nominal distinction only. He died 4th Aug., 1927.

DILMAN'. A town, Persia, province of Azerbaijan, 75 miles west of Tabri. Pop. estimated at 15,000.

DILO'LO. A small lake in Angola, near the southern boundary of Belgian Congo, lat. 11° 22′ S.; long. 22° 34′ E.; regarded as the source of the Zambesi.

DIL'UENTS (Lat. *dīluere*, to wash away). In medicine, are those substances which are taken to increase the proportion of fluid in the blood. They consist of water and watery liquors.

DILU'VIUM. The name formerly given by geologists to certain gravels

and comparatively recent deposits, which seemed to have been the result of a rush of water or deluge.

DIME (Fr. *dîme*, Lat. *decimus*, tenth). The term for the tenth part of a dollar or ten-cent piece in the United States of America, a silver coin whose English equivalent is about 5d. Hence the phrases *dime novels*, *dime museums*, etc.

DIMENSIONS, Algebraical. There are three dimensions in space : length, breadth, and height or depth. An area is said to be of two dimensions because it has length and breadth only ; a volume is of three dimensions. In algebra terms like x^2, xy are said to be of two dimensions because there are two letters multiplied together, and their product would measure an area if each letter denoted a length. Similarly, x^3, xyz are said to be of three dimensions, and the meaning is extended to cover the product of any number of letters. An expression of more than one term is said to be of the same degree as its term of highest dimensions. For example, $3x^2y^2z^3 + 5xyz + 6x^3 + 3x^2y^2$ is said to be of the sixth degree because $x^2y^2z^2 = x \times x \times y \times y \times z \times z$ is of six dimensions.

Dimensions, Physical. One of the aims of physical science is to express all its measurements in terms of the three fundamental units of length, mass, and time. A velocity, for example, is specified by the number of units of length traversed in the unit of time, so that we may write $v = l \div t$, or $v = lt^{-1}$. On this account velocity is said to have the dimensions LT^{-1}. Similarly, acceleration, being velocity added per unit time, has the dimensions of velocity ÷ time, or LT^{-2} ; and force, being proportional to mass and acceleration jointly, has the dimensions MLT^{-2}.

Principle of Dimensions. When a physical law is expressed as an equation connecting the numbers of units of the quantities involved, every term in this equation must be of the same dimensions in any one of the fundamental units. This is the *Principle of Dimensions*, first stated by Joseph Fourier, founder of the theory of the conduction of heat. In order to see its truth, we have only to observe that an equation containing terms of different dimensions would give inconsistent results if the unit of length were varied. Suppose it to be suggested, for example, that the period of vibration t of a simple pendulum of length l is given by the formula $t = 2\pi l/g$, where g denotes the acceleration of a falling body. The dimensions of the expression on the right are $L \div (LT^{-2})$, or T^2, whereas the term t on the left has dimensions T^1. Suppose the unit of length is the foot and the unit of time the second, so that $g = 32$, and let $l = 3$. We find in this case $t = \frac{6\pi}{32}$, so that the period is $\frac{3\pi}{16}$ seconds. But if we change the unit of time to one minute, g becomes $32 \times 60 \times 60$, and the formula gives $t = \frac{6\pi}{32 \times 60 \times 60}$, so that the period is $\frac{3\pi}{16 \times 60 \times 60}$ minutes.

The two results are obviously inconsistent. If, however, we take the correct formula, namely $t = 2\pi\sqrt{(l/g)}$, we find on trial that we obtain the same value for the period however we change the unit of time or the unit of length. Both sides are in this case of dimensions T^1.

The principle of dimensions provides therefore a useful check on the accuracy of formulæ. But it does much more than this. It often gives very valuable information about the relations of physical phenomena in cases where these relations are far too complicated to be completely worked out by mathematical analysis. To mention but one example, it is by the use of this principle that modern naval architecture is able to predict the behaviour of ocean-going ships from experiments in ponds on small-scale models.

DIMIN'UTIVE. In grammar, a word having a special affix which conveys the idea of littleness, and all other ideas connected with this, as tenderness, affection, or contempt. The opposite of *diminutive* is *augmentative*. In Latin, diminutives almost always ended in *-lus*, *-la*, or *-lum* ; as *Tulliola*, *meum corculum*, little Tullia my dear, or little heart ; *homunculus*, a manikin. The Italian is particularly rich in diminutives and augmentatives, such compound diminutives as *fratellinucciettinetto* (a diminutive of *frate*, brother) being sometimes employed.

Among English diminutive affixes are *-kin*, as in *manikin*, a little man ; *pipkin*, a little pipe ; *-ling*, as in *gosling*, a little goose ; *darling*, that is, dearling, or little dear ; and *-et*, as in *pocket*, from poke, a bag or pouch ; *tablet*, a little table. Diminutives are not confined to nouns, and *dandle*, *scribble*, *tipple*, are examples of diminutive verbs, and *greenish*, *whitish*, are diminutives of adjectives. Diminutives are also formed, in colloquial and familiar language, by adding *-y* or *-ie* to the names, as *Charley*, *Mousie*, etc.

DIM'ITY. A stout cotton fabric, ornamented in the loom either by

raised stripes or fancy figures. It is usually employed white, as for bed and bedroom furniture.

DIMORPH'ISM. In crystallography the crystallization of a body in forms belonging to two different systems, or in incompatible forms of the same system, a peculiarity exhibited by sulphur, carbon, etc.

DIMORPHISM. In botany. *See* HETEROSTYLY.

DINAJPUR'. A town, India, Bengal, capital of a district of same name, 205 miles north of Calcutta; pop. 16,000.—The district covers an area of about 4126 sq. miles; pop. 1,687,860.

DINAN (dē-näṅ). A town, France, department of Côtes-du-Nord (Brittany), on the Rance, 14 miles south of St. Malo. It was besieged and captured by the English under the Duke of Lancaster in 1359, but retaken by Du Guesclin. It stands on a steep hill nearly 200 feet above the river, is surrounded by high old walls pierced with four gates, and is a picturesque and interesting old place. In the cathedral of St. Sauveur the heart of Bertrand du Guesclin is buried. Pop. 11,410.

DINANT (dē-näṅ). A town, Belgium, in the province and 14 miles S. of Namur; picturesquely and strongly situated on the Meuse; a place of antique appearance. The town house was once the palace of the Princes of Liége. The town was destroyed by the Germans in 1914. It is one of the most popular Belgian summer resorts. Pop. 7690.

DINA'PUR. A town, India, Patna district, Bengal, on the right bank of the Ganges, about 5 miles northwest of Patna, cantonment and military headquarters of the district, with extensive barracks. The environs are studded with handsome bungalows. Pop. 31,025.

DINAR (Lat. *denarius*). Formerly an Arab gold coin, also a Persian coin; at present the chief Yugoslavian coin, value one franc.

DI'NAS BRICKS. An infusible kind of brick made of a peculiar rock, containing 98 per cent of silica, with a little alumina, which occurs at Dinas, in the Vale of Neath, in Glamorganshire, S. Wales. The rock is crushed, moistened with water, and moulded by a machine.

DINDIGUL. A town of India, Madura district, Madras, with a fort on rocky height; manufactures cigars. Pop. 30,922.

DINDINGS, The. Properly two small islands, also called **PANGKOR ISLANDS,** in the Straits of Malacca, belonging to the Straits Settlements, off the coast of Perak (British). The name now includes a strip of territory on the Malay Peninsula opposite; total area about 265 sq. miles, two-thirds of which is covered by dense forests. Coconuts, coffee, and pepper are grown with success. Lumut, on the mainland, has a fine natural harbour.

DIN'DORF, Karl Wilhelm. German classical scholar, born 1802, lived most of his life at Leipzig, and died 1883. His chief publications were editions of the Greek dramatists (*Poetæ Scenici Græci*) and works elucidative of them and other Greek writers.

DINGLE. Seaport and market town of Kerry, Irish Free State. It is on the railway, 30 miles from Tralee, and is a fishing centre. There is a harbour. Pop. 1884.

Dingle Bay is an arm of the Atlantic. It is 24 miles long and at its entrance are Bray and Dunmore Heads.

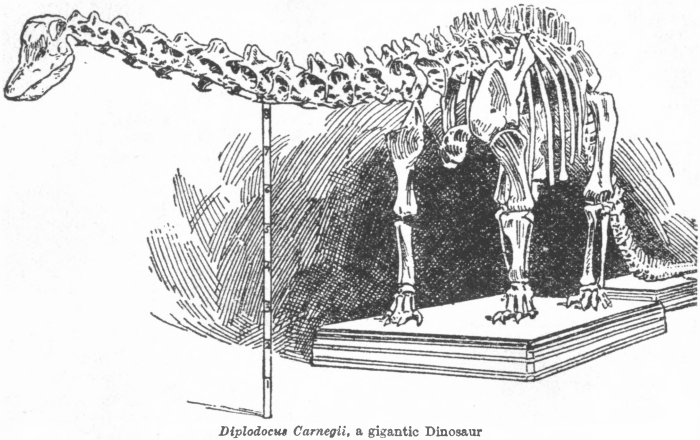
Another Dingle is a part of Liverpool. In it is Dingle Point, a prominent mark on the Mersey.

DINGO, The native wild dog of Australia (*Canis Dingo*), of a wolf-like appearance and extremely fierce. The ears are short and erect, the head elongated, the tail rather bushy, and the hair of a reddish-dun colour. In habit the dingo is rather fox-like, usually lying concealed throughout the day and making predatory expeditions at night. It is very destructive to sheep, killing more than it eats. It was probably introduced by prehistoric man.

DING'WALL. A royal and parliamentary burgh and seaport of Scotland, county town of Ross and Cromarty, situated at the head of Cromarty Firth. This town was erected into a royal burgh in 1226 by Alexander II., and its charter was renewed by James IV. Pop. (1931), 2554.

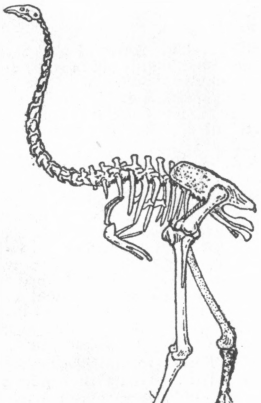
DINO'CERAS (Gr. *deinos*, terrible, *keras*, a horn). A fossil mammal found in the Eocene strata of North America, in some respects akin to the elephant and of equal size, but without a proboscis. Its bones were very massive; it had two vertical tusks in the upper jaw, three pairs of horns, and the smallest brain, proportionally, of any known mammal.

DINOR'NIS (Gr. *deinos*, terrible, *ornis*, a bird). An extinct genus of large wingless birds—classed with the small existing Apteryx. The bones of several species have been found in New Zealand. The largest must have stood 12 feet in height, several of its



Diplodocus Carnegii, a gigantic Dinosaur
Length, 84 feet 9 inches; height at middle of back, 11 feet 5 inches

bones being at least twice the size of those of the ostrich. The body seems to have been even more bulky in proportion, the tarsus being short and stout in order to sustain its weight. They do not appear to have become extinct until the seventeenth or eighteenth century, and are spoken of as *moas* by the natives, who buried the eggs (more than 1 foot long) with their dead as provision for their journey to the other world.



Dinornis maximus (the Moa)

DINOSAU'RIA (Gr. *deinos*, terrible, and *sauros*, a lizard). A group of extinct reptiles, allied in skeletal structure both to the lizards and the birds. While some were only 3 feet long, a large number attained gigantic size, Atlantosaurus being 115 feet long. Many were carnivorous, but some of the large heavy forms were herbivorous, and protected by bony spines or plates. The Dinosaurs were the dominant land animals of the Jurassic and Cretaceous periods.

DINOTHE'RIUM (Gr. *deinos*, terrible, *thērion*, beast). A genus of extinct gigantic proboscidean mammals, precursors of the elephants, the remains of which occur in Miocene formations in several parts of Europe.

The type-species (*D. giganteum*) is calculated to have attained the length of 18 feet. It had a proboscis and also two tusks placed at the anterior extremity of the lower jaw, and curved downwards somewhat after the manner of those in the upper jaw of the walrus. The skull is best known from that found in 1835 at Eppelsheim; but the skeleton can now be pieced together from remains in various localities. The vertebræ resemble those of mastodon. Dinotherium may have inhabited rivers or estuaries.

DI'OCESE (Gr. *dioikēsis*, administration). The circuit or extent of a bishop's jurisdiction. Each English diocese is divided into archdeaconries, each archdeaconry (nominally) into rural deaneries, and each deanery into parishes. In the Eastern

Churches the term *eparchy* is used for diocese. *See* BISHOP.

DIOCLE'TIAN (Gaius Valerius Diocletianus, surnamed Jovius). A man of mean birth, a native of Dalmatia, proclaimed Emperor of Rome by the army A.D. 284. He defeated Carinus in Mœsia (286), conquered the Allemanni, and was generally beloved for the goodness of his disposition, but was compelled by the dangers threatening Rome to share the government with M. Aurelius Valerius Maximian.

In 292 Galerius and Constantius Chlorus were also raised to a share in the empire, which was thus divided into four parts, of which Diocletian administered Thrace, Egypt, Syria, and Asia. As the result of his reconstitution of the empire there followed a period of brilliant successes in which the barbarians were driven back from all the frontiers, and Roman power restored from Britain to Egypt. In 305, in conjunction with Maximian, he resigned the Imperial dignity at Nicomedia, and retired to Salona, in Dalmatia, where he cultivated his garden in tranquillity until his death in 313. In the latter part of his reign he was induced to sanction a persecution of the Christians.—BIBLIOGRAPHY: Gibbon, *Decline and Fall*; P. Allard, *La Persécution de Dioclétien*; A. J. Nason, *The Persecution of Diocletian.*

DIODA'TI, Giovanni. Italian Protestant divine, born at Lucca, about 1576, of a noble Catholic family. He was for some time professor, first of Hebrew, then of theology, at Geneva, and in 1619 represented the Geneva clergy at the Synod of Dort, and aided in drawing up the Belgic confession of faith. He is most celebrated for a translation of the Bible into Italian (1607), which is superior to his translation of it into French. He died at Geneva in 1649.

DIODO'RUS, of Agyrium in Sicily, and therefore called **SICULUS.** A Greek historian in the time of Julius Cæsar and Augustus. His universal history, in the composition of which he travelled through a great part of Europe and Asia, occupied him thirty years, and consisted of 40 books, but only books 1-5 and 11-20, with certain fragments, are now extant.

DIŒCIOUS (Gr. *di*, double, *oikos*, a house). In botany, a term applied to plants which have flowers with stamens on one individual and those with pistils on another; as opposed to *monœcious.* The willow, the yew, the poplar, etc., are diœcious.

DIOGENES LAËRTIUS. Author of a sort of history of philosophy in Greek, appears to have been born at Laerte, in Cilicia, and to have lived towards the close of the second century after Christ; but no certain information exists either as to his life, studies, or age. The work is divided into ten books, and bears in MSS. the title, *On the Lives, Doctrines, and Apothegms of those who have distinguished themselves in Philosophy.* It is full of absurd and improbable anecdotes, but contains valuable information regarding the private life of the Greeks, and many fragments of works now lost. It was the foundation of the earlier modern histories of philosophy. A translation of his work by C. D. Yonge was published in Bohn's Classical Library.

DIOGENES (dī-oj'ē-nēz) **OF APOLLONIA** (Crete), known also as the *Physicist.* A Greek philosopher of the fifth century B.C., who belonged to the Ionian school, and considered air as the element of all things. He was a pupil of Anaximenes and a contemporary of Anaxagoras.

DIOGENES OF SINOPĒ (on the Black Sea). The most famous of the Cynic philosophers, born about 412 B.C., died about 323 B.C. Having been banished from his native place with his father, who had been accused of coining false money, he went to Athens, and thrust himself upon Antisthenes as a disciple. Like Antisthenes he despised all philosophical speculations, and opposed the corrupt morals of his time; but while the stern austerity of Antisthenes was repulsive, Diogenes exposed the follies of his contemporaries with wit and good humour. As an exemplar of Cynic virtue he satisfied his appetite with the coarsest food, practised the most rigid temperance, walked through the streets of Athens barefoot, without any coat, with a long beard, a stick in his hand, and a wallet on his shoulders, and by night, according to the popular story, slept in a tub (or large earthenware vessel).

On a voyage to the Island of Ægina he fell into the hands of pirates, who sold him as a slave to the Corinthian Xeniades. The latter emancipated him, and entrusted him with the education of his children. He attended to the duties of his new employment with the greatest care, commonly living in summer at Corinth and in winter at Athens. It is at Corinth that he is said to have had his famous interview with Alexander the Great. The Macedonian conqueror was so struck with the philosopher's self-possession that he went away remarking: "If I were not Alexander, I should wish to be Diogenes."

Of the many stories related of him the majority are probably fictions; and, indeed, are chronologically impossible. Concerned with practical wisdom, Diogenes established no system of philosophy. To gain virtue, he maintained, man must avoid physical pleasure, despise the conventions of society, and adopt a simple and natural life. His enemies accused him of various scandalous offences, but there is no ground for supposing him guilty of any worse fault than that of elevating impertinence to the rank of a fine art. *See* CYNICS.

DIOMEDES (dī-o-mē'dēz). In Greek mythology, (1) the son of Mars and Cyrene, and King of the Bistŏnes in Thrace, who fed his horses on human flesh, and used to throw all strangers who entered his territories to those animals to be devoured. He was killed by Hercules, who carried off the horses. (2) One of the heroes at the siege of Troy, the son of Tydeus and Deïpyle, and King of Argos, one of the suitors of Helen. After she was carried off, Diomedes engaged in the expedition against Troy, in which his courage and the protection of Pallas rendered him one of the most distinguished heroes.

He wounded Aphrodite and Ares, and thrice assailed Apollo; and by carrying off the horses of Rhœsus from the enemies' tents, and aiding Ulysses in the removal of Philoctetes from Lemnos, he fulfilled two of the conditions on which alone Troy could be conquered. Finally he was one of the heroes concealed in the wooden horse by which the capture of Troy was at length accomplished. Different accounts were given of his after-life. He is often called *Diomede*.

DION CASSIUS, or **DIO CASSIUS.** A Greek historian, born about A.D. 155 at Nicæa, in Bithynia. After accompanying his father to Cilicia, of which he held the administration, he came to Rome about 180, and obtained the rank of a Roman Senator. On the accession of Pertinax Dion was appointed Prætor, and in the reign of Caracalla he was one of the Senators whom it had become customary to select to accompany the emperor in his expeditions, of which he complains bitterly.

In 219 he was raised to the consulship and about 224 became Proconsul of Africa. In 229 he was again appointed Consul; but feeling his life precarious under Alexander Severus, he obtained permission to retire to his native town of Nicæa. The period of his death is unknown. The most important of his writings, though only a small part is extant, is a *History of Rome*, written in Greek and divided into eighty books, from the arrival of Æneas in Italy and the foundation of Alba and Rome to A.D. 229.

DION CHRYSOSTOM. A Greek sophist and rhetorician and a favourite of Trajan; born A.D. 50, died about A.D. 110. Eighty of his orations (in excellent Attic) have been preserved.

DION OF SYRACUSE. In Greek history, a connection by marriage of the elder and the younger Dionysius, tyrants of Syracuse, over whom he long exercised great influence. He attempted to reform the younger Dionysius, but his enemies succeeded in effecting his banishment. He afterwards returned and made himself ruler of the city, but became unpopular, and in 353 B.C. one of his followers, Callipus of Athens, caused him to be assassinated.

DIONYS'IA. *See* BACCHANALIA.

DIONYS'IUS, St. A disciple of Origen, and Patriarch of Alexandria in A.D. 248. He was driven from the city in 250, and in 257 was banished to Libya, but was restored in 260. He died in A.D. 265.

DIONYSIUS OF HALICARNASSUS, in Caria. A Greek critic and teacher of eloquence, born about 70 B.C. He went to Rome about 30 B.C., where he wrote his *Roman Antiquities*, in twenty books, in which he relates (in Greek) the early history of Rome and its government up to the times of the first Punic War. We have the first nine books of this work entire, the tenth and eleventh nearly so, and some fragments of the others. His rhetorical writings are of greater value, especially his essays on the Greek orators. He died about 6 B.C.—Cf. Sir J. E. Sandys, *A History of Classical Scholarship*.

DIONYSIUS THE AREOPAGITE. That is, one of the judges of the Areopagus, at Athens, a convert to Christianity by the Apostle Paul about the middle of the first century, and the first Bishop of Athens, where he suffered martyrdom. Certain writings formerly ascribed to him consist of obscurely written treatises on mystical subjects. Scotus Erigena translated them into Latin.

In France, where a certain Dionysius (*see* DENIS, ST.) established the first Christian community at Paris in the third century, they were readily received, this Dionysius being without further inquiry taken for the Areopagite, because the origin of the Gallican Church could thus be carried back to the first century; and France gained a patron who was a

martyr and the immediate disciple of an apostle.—Cf. article in Smith's *Dictionary of Christian Biography*.

DIONYSIUS THE ELDER. In Greek history, tyrant or absolute ruler of Syracuse, born about 430 B.C. of obscure parentage. He obtained the rank of general, and afterwards of commander-in-chief; and, gaining the support of the army, he seized the supreme power in Syracuse, though only twenty-five years of age. He extended his rule over other cities in Sicily; and after some successes and reverses in the struggle with the Carthaginians, he gained a complete victory over them under the walls of Syracuse. In his expeditions into Lower Italy he reduced the city of Rhegium by famine (387).

After another short war with Carthage he lived some time in peace, occupied with writing poems and tragedies, with which he contended for the Olympian prize. In 368 he commenced a new war against the Carthaginians, but failed to drive them entirely out of Sicily. He is said to have died from a potion administered at the instigation of his son Dionysius the Younger (367 B.C.).

DIONYSIUS THE LITTLE (so called on account of his short stature). A Scythian monk who was abbot of a monastery at Rome in the beginning of the sixth century, and died about the year A.D. 530, according to others about 545, celebrated as the first to introduce the computation of time from the Christian era. This mode of computation, however, was not publicly used until the eighth century.

DIONYSIUS THE YOUNGER. A tyrant of Syracuse, who succeeded his father, Dionysius the Elder, in 367 B.C. For the purpose of recalling him from the excesses to which he was addicted, his kinsman Dion persuaded him to invite Plato to his court, but the influence of the philosopher effected no permanent change. Becoming suspicious of Dion, the tyrant banished him and confiscated his property, but in 357 B.C. Dion made himself master of Syracuse.

Dionysius fled to Locri, but after the murder of Dion recovered his power in Syracuse. His misfortunes, however, had rendered him more cruel, and Timoleon, who came to Syracuse with aid from Corinth against the Carthaginians, deposed him in 344 B.C. He was carried to Corinth, where he is said to have gained a living by giving lessons in grammar, or as one of the attendants on the rites of Cybele.

DIONY'SUS. The original Greek name of the god of wine, the name Bacchus, by which he was also called both by the Greeks and the Romans, being at first a mere epithet or surname.—Cf. R. Brown, *The Great Dionysiak Myth*.

DIOPHAN'TUS OF ALEXANDRIA. The first Greek writer on algebra, flourished, according to some authorities, about the middle of the fourth century after Christ. He is called the Father of Algebra, and left behind him thirteen books of *Arithmetical Questions*, of which only six are extant; and a work on *Polygonal Numbers*.

DIOP'SIDE. A calcium magnesium silicate, of the pyroxene series, occurring in igneous rocks and altered limestones, with a vitreous lustre, and of a pale-green, or a greenish- or yellowish-white colour.

DI'OPTASE. Emerald copper ore, hydrated silicate of copper, a translucent mineral, occurring crystallized in six-sided prisms. It occurs in Siberia, Hungary, and Chile. It has been used as a gem-stone, notably in Persia and Russia.

DIOPTER. The unit in terms of which the power of a lens or curved mirror can be expressed. It is obtained by taking the reciprocal of the focal length of the lens or mirror in metres. Thus, a lens with focal length 1 metre has a power of 1 dioptер. If the focal length is 2 metres, the power is ½ diopter. The power may also be obtained by dividing 39.37 by the focal length in inches. The unit is employed in classifying spectacle lenses.

DI'ORITE. A coarsely crystalline igneous rock, sometimes of a whitish colour speckled with black or greenish-black, sometimes very dark in colour, consisting of hornblende and calcium sodium felspar. Dark mica sometimes takes the place of hornblende (mica-diorite). The "green-stones" of older authors are mostly diorites.

DIOSCOREACEÆ. A nat. ord. of monocotyledons, with alternate reticulate-veined leaves, tuberous root-stocks, and twining stems. The flowers are small and unisexual. There are 6 genera, with about 100 species. The typical genus is Dioscorea, which includes the yam. Black bryony is the only British representative.

DIOSCOR'IDES, Pedanius. A Greek physician, born in Cilicia in the first century of the Christian era. He was the author of a celebrated work on *materia medica*, in five books, particularly valuable in regard to botany.

DIOSCU'RI. *See* CASTOR AND POLLUX.

DIOS'PYROS. A large genus of trees or shrubs, natives of the warmer regions of the world, nat. ord. Ebenaceæ. The trees of this genus supply ebony wood. That from Ceylon is the wood of *D. Ebĕnum*; from India, of *D. melanoxylon* and other species; and that from Mauritius, *D. tesselaria*. The Chinese date-plum (*D. kaki*) is an apple-like tree which produces large red fruits resembling tomatoes. In China and Japan this tree is as important as the apple is in Northern Europe.

DIP. Of the horizon, the angle of depression of the visible horizon at sea below the true horizontal direction, due to the height of the eye above the level of the sea. The dip in minutes of arc is approximately equal to the square root of the height in feet.—*Dip, magnetic,* or *Inclination,* is the angle which a magnetic needle free to move in a vertical circle in the magnetic meridian makes with the horizon. *See* DIPPING-NEEDLE.

DIP. In geology, the inclination or angle at which strata slope or *dip* downwards into the earth. The degree of inclination or amount of the dip, which is easily measured by a *clinometer,* is the steepest angle made with a horizontal plane by a line drawn in the surface of the stratum. The line of dip is hence perpendicular to the intersection of the stratum with the horizontal, which is called the *strike.*

DIP CIRCLE. *See* DIPPING-NEEDLE.

DIPHTHE'RIA. Is an acute infectious disease characterized by the formation of membrane in the throat and air-passages, and associated with severe disturbances affecting especially the heart and nervous system. It is due to a bacillus described by Koch in 1883. It is essentially a disease of the early years of life, and the period between two and twelve years covers the vast majority of cases. The commonest modes of infection are direct and indirect contact, infected milk, and defective drains. Of late years, the domestic cat has been held to be a source of infection. The disease runs a rapid course, beginning with fever, headache, chilliness, lassitude, and occasionally vomiting, while usually there is early complaint of sore throat. The membrane, which appears on the side of the throat, is usually of a dirty yellowish-white colour. It may be limited to a small area, but usually, if untreated, it would spread extensively over the throat, involving the palate and uvula.

Diphtheria beginning in the larynx (windpipe) is what is popularly called croup (q.v.). There is danger of death in severe cases during the first few days from early heart failure, and almost any time during convalescence late heart failure may occur. Late heart failure is one of the forms of post-diphtheritic paralysis which arise from disturbances of the nervous system. The other common varieties are paralysis of the palate, of the pharynx, of the eye muscles, and of the respiratory muscles. An effective treatment is found in diphtheric antitoxin, which should be administered as early as possible in the disease. It is given under the skin, and the dose is regulated by the severity of the attack.—BIBLIOGRAPHY: W. F. Litchfield, *Diphtheria in Practice*; W. R. Smith, *Harben Lectures.*

DI'PHYODONT. A term applied to those animals which develop two sets of teeth, a deciduous or milk set, and a permanent set—as distinct from the monophyodonts, which develop only one set. The majority of mammals are diphyodont, though the number of teeth replaced may vary: thus in man twenty teeth of the adult are preceded by a milk set.

DIPLACAN'THUS. A genus of ganoid fishes, found only in the Old Red Sandstone. They have small scales, a heterocercal tail, and two dorsal fins with a strong spine in front.

DIPLOID PHASE. In Botany. *See* GENERATIONS, ALTERNATION OF.

DIPLO'MACY. The science or art of foreign politics. In a more restricted sense the term denotes the science or art of conducting negotiations and arranging treaties between states and nations; the branch of knowledge which deals with the relations of independent states to one another; the agency or management of envoys accredited to a foreign court; the forms of international negotiations.

The word, borrowed from the French, was first used in England in 1796 by Burke. The Cardinal de Richelieu is generally considered as the founder of that regular and uninterrupted intercourse between Governments which exists at present between almost all the Christian powers; though the instructions given by Machiavelli to one of his friends, who was sent by the Florentine Republic to Charles V. (Charles I. of Spain) show that Richelieu was not the first to conceive the advantages that might be derived from the correspondence of an intelligent agent accredited at the seat of a foreign Government.

As a uniform system, however, with a fixed international status, diplomacy was only established in the nineteenth century at the Congresses

of Vienna (1815) and Aix-la-Chapelle (1818). Amongst the European powers it is agreed that of ministers of the same rank he who arrives first shall have the precedence over his colleagues.—BIBLIOGRAPHY: D. J. Hill, *History of Diplomacy in the International Development of Europe*; E. C. Grenville-Murray, *Embassies and Foreign Courts: a History of Diplomacy*; P. Pradier-Fodéré, *Cours de droit diplomatique*; L. Oppenheim, *International Law*; D. P. Heatley, *Diplomacy and the Study of International Relations*.

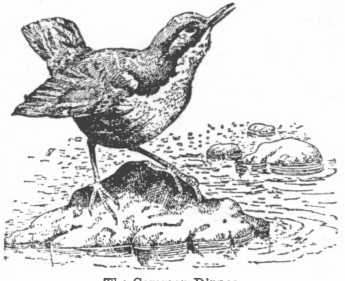
DIPLOMATIC SERVICE, The. As now existing, may be said to have originated in the Venetian Republic which employed ambassadors as early as the thirteenth century. At first these officials had a very brief term of office, rarely remaining at their post in a foreign country for more than two or three months. By the middle of the fifteenth century, however, a permanent Milanese embassy had been established at Genoa, followed by one at Paris in 1494; while two years later Venice was officially represented at London. The clergy, who for the most part alone possessed the requisite accomplishments for such work, were the usual ambassadors of the Middle Ages; but by the sixteenth century lawyers, or not seldom merchants, were employed. It was not till two hundred years later that the modern attachés, junior officials of an embassy, came into being.

The diplomatic service of Great Britain, controlled by the Foreign Office, includes (1) ambassadors, and (2) envoys and ministers plenipotentiary, both of which ranks represent the person of their sovereign and enjoy numerous special privileges in the country to which they are sent. Of lower standing are (3) ministers resident and (4) chargés d'affaires; the last-named are accredited, not to a sovereign, but to his foreign minister, and frequently act merely as temporary substitutes for an ambassador. Secretaries of more than one grade, with naval, military, and, of late years, commercial attachés, also form members of an embassy.

Candidates for the British diplomatic service require a nomination from the Foreign Secretary, must be between the ages of nineteen and twenty-five, are subjected to an examination, and are almost invariably young men of good birth and position. The service is distinguished and affords a pleasant, if to some extent an idle life; but it does not offer any prospect of financial fortune. Lord Stratford de Radcliffe (the "Great Elchi") and Lord Lyons rank high among distinguished British ambassadors. *See* CIVIL SERVICE.

DIPPEL'S OIL. A pharmaceutical preparation obtained by the destructive distillation of animal matter, such as horn, ivory, blood. The crude form was refined by Dippel, and at one time was a good deal used in medicine as a diaphoretic and hypnotic. It is a form of bone oil, a product obtained in the manufacture of bone-black, or animal charcoal, by the distillation of bones. Crude bone oil has a most offensive smell. It contains the carbonate and other salts of ammonium, and a large variety of organic substances.

DIPPER. A bird of the genus Cinclus, allied to the wrens. The common dipper, water-ouzel, or water-crow (*Cinclus aquaticus*), is a familiar European bird; it is about



The Common Dipper

7 inches in length, with a very short tail, small rounded wings, and large powerful feet; the bill is of moderate length, straight, and slender. The male has the upper part of the body dark brown, the throat and breast white, belly rusty. The dipper frequents streams, and feeds largely on water-insects and larvæ. It can dive and walk under water, effecting its progress by grasping the stones with its feet. The song is sweet and lively. Other species are found in North Asia, America, and North Africa.

DIPPING-NEEDLE, or **INCLINATION COMPASS.** An instrument for showing the direction of the earth's magnetic force. In essentials the instrument consists of a light magnetized steel bar supported on a horizontal axis which passes, as nearly as possible, through the centre of inerta of the bar. When a needle thus mounted is placed anywhere not in the magnetic equator, it dips or points downward; and if the vertical plane, in which it moves, coincides

with the magnetic meridian the position of the needle shows at once the direction of the magnetic force.

The angle between the magnetic axis of the dipping-needle and the horizontal is called the dip or inclination. This varies from 90° at the magnetic poles to 0° at the magnetic equator. The dip is 70° at Glasgow, and varies slowly with the passage of time. In the northern hemisphere, the north-seeking pole of the dipping-needle dips downwards, the reverse being the case south of the magnetic equator.

DIPRO'TODON. A gigantic fossil marsupial from Pleistocene beds in Australia, allied to the kangaroos. The skull is 3 feet long.

DIPSOMA'NIA (Gr. *dipsa*, thirst, and *mania*, madness). A term used to denote an insane craving for intoxicating liquors, when occurring in a confirmed or habitual form. It is a form of acute alcoholism seen in persons with a strong hereditary tendency to drink. The only remedy appears to be seclusion, with enforced abstinence and healthy occupation. Homes for this purpose have been established in Britain under the Habitual Drunkards Act of 1879 and Inebriates Act of 1888. There are corresponding institutions in the United States.

DIP'TERA. Two-winged flies, an order of insects embracing a vast number of species, of which about 40,000 have been named. The two transparent wings correspond to the fore-wings of other insects, the hind-wings being often represented by small club-shaped structures (halteres or balancers).

There are two large compound eyes, and the mouth-parts are often modified for piercing and sucking. There is a well-marked metamorphosis, the larvæ being usually limbless maggots. The Diptera include many agricultural and horticultural pests, and a number are notorious as disease carriers. *See* BLOW-FLY; BOT-FLY; CRANE-FLY; FLY; GNAT; HOVER-FLY; MIDGE MOSQUITO; TSETSE-FLY.

DIPTYCH (dip'tik). In Greek originally signified the same as *diploma*, something folded; the double tablets of metal, ivory, etc., used by the Greeks and Romans. Diptychs became important in the Christian Church, in them being written the names of Popes, and other distinguished persons, who had deserved well of the Church, to be mentioned in the church prayers. Diptychs also often contained pictures of biblical scenes.—Cf. Sir W. Smith, *A Dictionary of Greek and Roman Antiquities*.

DIPYRE (dī'pīr), or **MIZZONITE.** A mineral — aluminium calcium sodium silicate—of the scapolite series. Its name indicates the double effect of fire upon it (Gr. *di*, double, *pyr*, fire) in producing first phosphorescence, and then fusion.

DIRÆ. One of the names under which the Eumenides were known to the Romans. *See* FURIES.

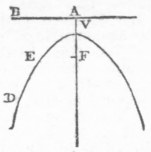
DIRECTOIRE. Form of architecture and furniture developed during the French Directory, which was in power 1795-99. It marked a gradual abandonment of the restrained classical grace in vogue under Louis XVI., passing into an enthusiasm for the heavier Roman motives. Its influence upon contemporary taste in England was slight.

DIRECTORS. Persons elected to meet together at short, fixed intervals and consult about the affairs of corporations or joint-stock companies, and to advise and assist the manager. These are termed *Ordinary Directors*, as in many companies there is a body called *Extraordinary Directors*, who have little or no business functions, and are chosen as a rule on account of their social position imparting a degree of distinction to the concern. Directors are appointed by a general meeting of the shareholders in the undertaking, and a certain number of them, usually a third, retire every year. Ordinary directors are granted a certain remuneration for their services. The duties and responsibilities of directors are defined by the constitution of the company, or by the various Acts of Parliament affecting joint-stock and other companies.

DIREC'TORY. The name given to a body of five officers to whom the executive authority in France was committed by the Constitution of the year III. (1795). The two legislative bodies, called the *councils*, elected the members of the Directory: one member was obliged to retire yearly, and his place was supplied by election. This body was invested with the authority which, by the Constitution of 1791, had been granted to the king. By the Revolution of the 18th Brumaire the Directory and the Constitution of the year III. were abolished. It was succeeded by the Consulate, with Napoleon as First Consul.

DIREC'TRIX. A fixed line that is required for the description of a curve. The term is chiefly used in connection with the parabola, ellipse, and hyperbola, which are the loci of points that move so that their distances from a fixed point (the

focus) are in a constant ratio to their distances from the directrix. The directrix of a parabola is a line perpendicular to the axis produced, and



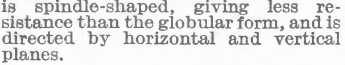
Directrix of a Parabola

at a distance from the vertex equal to the distance of the vertex from the focus. Thus A B is the directrix of the parabola V E D, of which F is the focus.

DIRGE. Funeral song or hymn. The word is a corruption of the opening word in the Roman Catholic office for the dead, *Dirige, Domine*, etc.

DIRIGIBLE. Term applied to navigable balloons and non-rigid airships. The earliest type was a slightly elongated balloon propelled by oars or propellers and worked by hand power. The modern non-rigid type, the result of many experiments, is spindle-shaped, giving less resistance than the globular form, and is directed by horizontal and vertical planes.

DIRK. A kind of dagger formerly used as a weapon of offence by the Highlanders of Scotland. Dirks are



Dirk

worn by midshipmen and cadets of the Royal Navy, and still form part of the full Highland costume.

DIRK-HARTOG ISLAND. On the west coast of Australia, 45 miles long, north to south, and 10 miles broad.

DIRT-BEDS. In geology, layers of ancient soil, such as those in the Oolitic strata of the Isle of Purbeck (Dorset), which contain the stumps of trees that once grew in them.

DISABILITY. In law, incapacity to do any legal act. It is either *absolute*, which wholly disables the person, such as outlawry or excommunication —or *partial*, such as infancy, coverture, insanity, or drunkenness.

DISBARRING, or DISBARMENTS. Expelling a barrister from the Bar, a prerogative which, in England, is possessed by the benchers of each of the four Inns of Court. The party disbarred may lodge an appeal with the judges in their capacity of visitors.

DISC, or DISK. The central part of the capitulum of compositæ, surrounded by the ray. Also a part of a flower, sometimes cup-shaped, at the base of the stamens, consisting in some cases of rudimentary stamens, in others of the modified receptacle.— In astronomy the term is applied to the visible face or figure exhibited by the sun, moon, or a planet. In the case of the moon and certain planets it may be of gibbous, semi-circular, or crescent form.

DISCIPLINE, Books of. Two books connected with the Church of Scotland. The *First Book of Discipline* was drawn up by John Knox and four other ministers, and laid before the General Assembly in 1560. Though not formally ratified by the Privy Council, it was secretly subscribed by the greater part of the nobility and barons who were members of the Council. Another similar document, the *Second Book of Discipline*, was prepared and sanctioned by the General Assembly of 1578, and has from that time been recognized as the authorized standard of the Church of Scotland in respect of government and discipline.

DISCLAIMER. In its stricter legal sense, a plea containing renunciation or a denial of some claim alleged to have been made by the party pleading.

DISCO. Ball game introduced into London in 1928. It resembles badminton, but the play is faster. Underhand service is compulsory and modern racquets are used. The court is 40 ft. long and 16 ft. wide, divided by a net, 4 ft. high. The service lines are marked between two posts 14 ft. back from the net. On each post is a disc, 20 in. across. If the ball fails to clear the net or goes out of the court one point is lost, but if it hits a disc five points are gained. Games are for 15 points, and a set is the best out of five games.

DISCO'PHORA. (1) a sub-class of the Hydrozoa, comprising most of the organisms known as sea-jellies, jelly-fishes, and sea-nettles; (2) leeches (q.v.).

DIS'COUNT. The charge made by a banker for interest of money advanced by him on a bill or other document not presently due. In advancing money on such a security the banker deducts the charge for interest on his advance from the total amount represented on the security, pays the difference, which is called the *proceeds* of the bill, to the person parting with it, and collects the full amount to reimburse himself for outlay and interest at maturity. Popularly the term *discount* is applied to any de-

duction from the full amount of an account made by the party to whom it is paid, especially on prompt or early payment. When a bill which has been *discounted* is paid by the acceptor before it is due, the discount allowed for prepayment is called *rebate*.

DISCUS, DISC, or **DISK.** Among the Greeks and Romans a quoit of stone or metal, convex on both its sides, sometimes perforated in the middle. The players aimed at no mark, but simply tried to throw the

Discobolus

quoit to the greatest possible distance. It was sometimes furnished with a thong of leather to assist in the throwing. The thrower of the discus was called *discobolus*.

DISEASES OF PLANTS. *See* PLANT PATHOLOGY.

DISENDOWMENT. Sequestration by the State of property belonging to the Church. It usually accompanies disestablishment. By Acts of Parliament passed in 1869 and 1914 the Irish and Welsh Churches were disendowed, the clergy receiving life interests in their benefices. Proposals have been put forward for disendowing the Church of England, but its advocates maintain that property definitely left to the Church within recent years should not be appropriated by the State.

DISESTABLISHMENT. The severance of connection between Church and State, with the resultant emancipation of the Church from civil control, is a movement in which there has been considerable growth during the last half-century. The Church of the West Indies was disestablished in 1868, and all Colonial Churches, with the exception of the Church in India, are now free from State authority. In 1869 an Act, taking effect two years later, was passed for the disestablishment of the Church of Ireland, in which country the mass of the inhabitants are Roman Catholics. In France all recognition of Roman Catholicism as the State religion ceased in 1905, the French Government now tolerating all religions. In 1914 was passed a Bill for disestablishing the Church in Wales, though its effect was, owing to the war, deferred till 1920 by the Suspensory Bill. The Church of Scotland has been practically free from State control since 1874, in which year patronage was abolished; and the presence of the Lord High Commissioner, who represents the sovereign at the opening of the General Assembly, and the precedence enjoyed by the Moderator during his term of office, are little more than decorative courtesies. Among a section of the English public there has been from time to time an agitation for the disestablishment of the Church of England; and the movement is even said to be viewed with favour by some advanced High Churchmen, who believe that it would result in increased freedom for the adoption of their special views; but, though a Disestablishment Society exists, there seems no immediate prospect of a decisive step in this direction.

DISFRANCHISEMENT. Act of depriving people of the right to vote or to be represented on an elected body. Parliamentary constituencies have been disfranchised by Act of Parliament from time to time, chiefly because of their small size. This was done in 1832, 1867, 1884 and 1918. The electors, however, retain their right to vote, doing so in a larger constituency which includes the disfranchised one.

The disfranchisement of individuals is now a rare event, but conscientious objectors were so treated for a limited period after the Great War. At one time excise officials in Great Britain were not allowed to vote.

DISINFECTION. The means employed for killing the germs of infectious or contagious disease by physical or chemical agencies. The former are the more important, and consist in applying water or steam at the boiling-point, or hot air at 160° C. Ten minutes' boiling, or half an hour in hot air, kills all ordinary disease germs, but a longer exposure is necessary to kill germs (especially those of putrefaction), which form spores (*see* BACTERIA). The most important chemical agents are chlorine, iodine, carbolic acid, bleaching

powder, Condy's red fluid (containing permanganate of potash), perchloride of mercury, formalin, and flavine. Carbolic acid is one of the most effective, needing, however, care in the handling, as it is very poisonous and in strong solution causes severe burns. It does not in its common form mix with water, but solutions can be made by using hot water. A greater dilution than 1 part in 40 of water is useless as a disinfectant.

For application to the skin, tincture of iodine is one of the readiest preparations. In cases of infectious disease the most important points are the immediate disinfection of all the excretions of the patient. Expectoration should be received into a sputum-cup containing 1-20 carbolic acid, and all handkerchiefs when soiled should be similarly treated. The personal linen and sheets of the patient should be placed in carbolic acid (1 40) in a slop-pail, and should be boiled before being sent to the laundry. All plates, spoons, etc., used for the patient's food, should be boiled or scalded immediately after use. The excretions of the bowels or kidneys should be treated with bleaching powder.

Those in attendance should wear an overall when in the sick-room, and should wash the hands and face before coming into contact with any one outside. They should wash out the mouth frequently with Condy as strong as can be tolerated. Their linen should be treated in the same way as that of the patient. At the close of the illness all bedding should be baked in the hot-air oven which most local authorities now provide for the purpose. Everything washable in the sick-room should be washed with soft soap, and it is better that the room should be repapered.

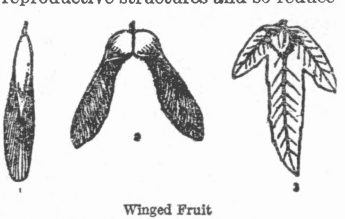
DISLOCA'TION. A surgical term applied to cases in which the articulating surfaces of the bones have been forced out of their proper places. The particular dislocation takes its name either from the joint itself or its farthest bone, and is called *compound* when accompanied by an external wound.

The most common dislocations are those of the hip, shoulder, elbow, knee, and ankle, and the chief obstacle to their reduction is the spasmodic and violent contraction of the muscles consequent upon them, the application of considerable force being often necessary to set the joint. Chloroform is of great use, not only in preventing pain but in relaxing the muscles. The most dangerous dislocations are those of the bones of the spine.—In geology it signifies the displacement of parts of rocks or portions of strata from the situations they originally occupied.

DISMAL SWAMP. A large tract of marshy land in America, beginning a little south of Norfolk, in Virginia, and extending into North Carolina, containing 150,000 acres; 30 miles long from north to south, and 10 miles broad. This tract was entirely covered with trees, with almost impervious brushwood between them, but it has now in part been cleared and drained. In the midst of the swamp is a lake, called *Drummond's Pond*, 7 miles in length. A navigable canal through the swamp connects Chesapeake Bay and Albemarle Sound.

DISPENSA'TION. Is the act by which an exception is made to the rigour of the law in favour of some person. The Pope may release from all oaths or vows, and may sanction a marriage within the prohibited degrees of the Mosaic law, or exempt from obedience to the disciplinary enactments of the canon law. In England the monarch claimed, in former times, a similar dispensing power in civil law, but the prerogative was so much abused by James II. that it was abolished by the Bill of Rights. The power of commuting sentences in capital cases is the only form in which the dispensing power of the Crown still exists. In ecclesiastical matters a bishop may grant a dispensation allowing a clergyman to hold more than one benefice, or to absent himself from his parish.—Cf. F. W. Maitland, *Constitutional History of England*.

DISPERSAL OF SEEDS AND FRUITS. Serves (*a*) to scatter these reproductive structures and so reduce



Winged Fruit
1, Ash. 2, Sycamore. 3, Hornbeam.

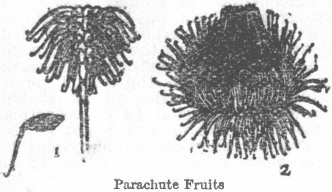
internecine competition; (*b*) to bring the seeds into new surroundings, which may be more favourable than those of the parent plant. The chief agents of dispersal are wind and animals. Very minute seeds, like those of orchids, are carried away by the gentlest air-currents. Larger wind-borne seeds are *winged*, as in

the pine, most Bignoniaceæ, etc.; or provided with a tuft of hairs acting as a *parachute*, as in willow, willow-herb, cotton, etc. Winged *fruits* are exemplified by ash, elm, sycamore,

Hooked Seeds

1, Ripe fruit of willow-herb, dehiscing. 2, Single fruit of clematis 3, Single fruit of dandelion.

many docks, etc.; parachute *fruits* by Compositæ, Clematis, cotton-grass, etc. In the case of animal dispersal, the whole fruit is usually involved, being either *edible*, with hard indigestible seeds which are cast up or voided with excreta (fleshy fruits), or *hooked* so as to adhere to fur or wool, as in bidens, cleavers, enchanters'



Parachute Fruits

1, Geum and single fruit. 2, Burdock.

nightshade, and other "burs." A small number of fruits and seeds, such as the coconut and the seeds of water-lilies, are adapted for water transport. In certain cases seeds are scattered for short distances by an "explosive" mechanism, as in wood-sorrel, impatiens, sand-box tree, squirting cucumber, and other "sling" fruits.

DISPERSION. In optics, the angular separation of light rays of different colour, that is, of different wave-length. Dispersion may be caused either by refraction or by diffraction. When a beam of composite light passes obliquely from air into a second transparent medium, each constituent of the light is bent or refracted through a different angle from the original direction of the beam, with the result that the different colours are separated fan-wise, or dispersed at the surface of the second medium.

In the refraction spectrum of white light, when caused by passage through a glass prism, the red rays are least deviated and the violet rays most deviated, if we consider only the visible spectrum. The difference of the angles of deviation for two selected rays measures their dispersion, and if this angle is divided by the deviation of the mean ray, we obtain the dispersive power of the prism. Transparent media vary in their dispersive powers; for example, carbon disulphide has more than three times the dispersive power of crown glass.

The true nature of dispersion was first demonstrated by Newton, who concluded that the colours of the spectrum were homogeneous and caused by simple vibrations of definite wave-length, the different colours being unequally refrangible. Newton was, however, led to the erroneous view that the dispersion was proportional to the refraction. This was later disproved by the construction of achromatic lenses, or lenses which caused deviation without dispersion, and of direct-vision spectroscopes, or instruments which caused dispersion with no deviation of the central part of the spectrum.

The dispersive power is not the same for all parts of a refraction spectrum; besides, the same colours do not occupy the same positions in spectra formed by prisms of different material. This arises from the fact that there is no simple relation between the deviation of a ray and its wave-length; consequently, such spectra are called irrational, and the property is known as the irrationality of dispersion. In the diffraction spectrum, the order of the colours is reversed, red undergoing the greatest deviation; also, the deviation for a given colour is nearly proportional to the wave-length. The diffraction spectrum is therefore termed a normal spectrum.

All substances do not give the same order of colours in their spectra; certain exceptions are known in which the usual order of the colours is changed. Christiansen showed that an alcoholic solution of fuchsine gave a spectrum containing only violet, red, and yellow; the violet is least refracted, and the yellow most, and a dark band lies between the violet and the red. This has been called anomalous dispersion, and similar effects have been observed in iodine and sodium vapours and in solutions of colours derived from aniline which exhibit surface colour.

The theory of dispersion now generally accepted is that of Sellmeier, which was published in 1871. Sellmeier assumed that when light waves pass through a material substance, they set the particles of the substance

vibration, and these resonant brations react in such a way as to odify the velocity with which the aves are transmitted. Applying the ynamical principles of wave motion the case of an elastic solid in which eavy particles are embedded, Sellieler obtained an equation which onnected the refractive index of the abstance with the wave-length of the cident light. Equations of similar orm were subsequently derived by Cetteler and Helmholtz.

The consideration of Sellmeier's quation leads to important conlusions. If the period of vibration of he incident waves is very short, as ompared with those of the particles orming the solid, no refraction will ake place, and the rays will travel hrough the solid without deviation nd without change of velocity. This s verified in the case of X-rays, which onsist of extremely short waves and vhich are not deviated on passing hrough light-opaque solids. Sellneier's equation may also be modified o apply to the case of anomalous dispersion. The phenomenon is lways associated with absorption of ight of a particular wave-length or ange of wave-lengths, and the conlusion is drawn that the medium will possess an abnormally high refractive index for waves slightly longer than those which it absorbs, and an abnormally low index for waves slightly shorter than those which it absorbs.

This result has been verified by various investigators. Rubens has determined the values of the constants in Sellmeier's equation for rock-salt, sylvine, fluorspar, and quartz, and has shown that the equation gives correct values for the refractive indices of these substances over the entire range of wave-lengths to which they are transparent.—BIBLIOGRAPHY: T. Preston, *Theory of Light*; E. Edser, *Light for Students*; P. Drude, *Theory of Optics*.

DISPLACEMENT. The position of a point in space is fixed by means of its distances x, y, z, from three mutually rectangular planes. If the point moves to another position, it is said to be displaced, and the rates of displacement parallel to these planes measure the velocities $\frac{dx}{dt}$, $\frac{dy}{dt}$, $\frac{dz}{dt}$, parallel to these planes. If the acting forces be resolved in directions parallel to these planes, relations may be found between the forces, the accelerations parallel to the planes and the mass of the body. These relations are called the equations of motion.

In hydrostatics a body immersed in a liquid displaces a certain volume of the liquid, and the upthrust of the liquid in the body is, by the principle of Archimedes, equal to the weight of liquid displaced. It follows that, in the case of a floating ship, the weight of the ship is equal to the weight of water displaced. This weight is called the displacement of the ship, and is measured in tons.

DISPOSITION. In Scots law, a deed conveying property. Used alone the word signifies a conveyance of heritage. A trust disposition and settlement is a conveyance, heritable and moveable, to testamentary trustees for disposal.

DISRAELI, Benjamin. *See* BEACONSFIELD.

D'ISRAELI (diz-rā'e-li), **Isaac.** Man of letters, and father of the well-known statesman, was born at Enfield, Middlesex, in 1766, died in 1848. His father, Benjamin D'Israeli, a descendant of a family of Spanish Jews which had settled at Venice in the fifteenth century to escape the Inquisition, came over to England in 1 48 and made a large fortune. Isaac D'Israeli, however, showed a strong repugnance to commerce, and was finally permitted to follow his literary bent. An anonymous reply to Peter Pindar, entitled *On the Abuse of Satire*, was followed during 1791 to 1793 by the appearance of his *Curiosities of Literature*, the success of which determined much of his afterwork.

His *Essay on the Literary Character* was published in 1795, and some time afterwards a volume of romantic tales, *The Loves of Mejnoun and Leila*. Between 1812 and 1822 appeared his *Calamities of Authors*, *Quarrels of Authors*, and *Inquiry into the Literary and Political Character of James I.*; the three being afterwards published collectively under the title of *Miscellanies of Literature*. In 1828 appeared the commencement of his *Life and Reign of Charles I.*, a work completed in 1831. An affection of the eyes put an end to a projected *Life of Pope* and a *History of English Freethinkers*, but in 1841 he published a selection from his MSS. under the title of *Amenities of Literature*. The greater part of his life was passed in his library. For his son, *see* BEACONSFIELD.

DISRUPTION. The name commonly applied in Scotland to the act by which, in 1843, 474 ministers and professors of the Established Church gave up their livings to vindicate principles which they held to be essential to the purity of the Church,

and in harmony with its earlier history. *See* FREE CHURCH.

DISS. A town, England, Norfolk, on the slope of a hill 22 miles south by west of Norwich. It was formerly noted for the manufacture of "Suffolk hempen cloth," worsted yarn, and knit hosiery. Pop. (1931), 3422.

DISSEI'ZIN, or DISSEISIN. In law, is the dispossessing one of a freehold estate, or interrupting his *seisin*. Of freeholds only can a seizin be had, or a disseizin done. Whether an entry upon lands is or is not a disseizin, will depend partly upon the circumstances of the entry, and partly upon the intention of the party as made known by his words or acts.

DISSENT'ERS. The common name by which in Britain all Christian denominations, excepting those of the Established Churches, are usually designated, though in Acts of Parliament it generally includes only Protestant dissenters, Roman Catholics being referred to under their specific name. The most important bodies of English dissenters are the different bodies of Methodists, the Congregationalists, and the Baptists; and of Scottish dissenters, the United Free Church and the Free Church. The Nonconformists were dissenters from the English Church, and the name is sometimes used as meaning simply dissenters, though it has properly a wider meaning.

DISSENTIS'. A Swiss town, canton of Grisons, 3800 feet above the sea, at the junction of the Middle and Vorder Rhine, with a Benedictine abbey established so long ago as A.D. 614. Pop. 1420.

DISSERTATION. Formal discourse or treatise. The word especially denotes a written essay or thesis, required of candidates for university degrees independent of set examinations. Such theses are offered for the degrees of Doctor of Literature, D.Litt., at London University, docteur-ès-lettres at the Paris Sorbonne, and Doctor of Philosophy, Ph.D., at some German universities.

DISSOCIATION. Certain substances tend to break down into simpler substances with change of temperature; thus ammonium chloride on heating gives a mixture of hydrochloric acid (HCl) and ammonia (NH_3), and on cooling these substances recombine to give ammonium chloride (NH_4Cl) again. Dissociation is therefore a particular case of decomposition, where the products of decomposition recombine on obtaining the original conditions.

DIS'SONANCE. In music, that effect which results from the union of two sounds not in accord with each other. The ancients considered third and sixths as dissonances; and, in fact, every chord except the perfect concord is a dissonant chord. The old theories include an infinity of dissonances, but the present receive system reduces them to a comparatively small number. The most common are those of the tonic against the second, the fifth against the sixth, or (the most frequent of all) the fourth against the fifth.

DISTEMP'ER. A disease of the dog commonly considered as of a catarrhal nature. In most cases a running from the nose and eyes is one of the first and chief symptoms, the defluxion becoming after some time mucous and purulent. The animal is subject to violent fits of coughing combined with vomiting, loses its appetite, its flesh begins to waste, and if the disease be virulent symptoms of affection of the brain manifest themselves, accompanied by fits, paralysis, or convulsive twitchings.

In the first stage of the disease laxatives, emetics, and occasional bleeding are the principal remedies; diarrhœa should be checked by astringents, and to reduce the violence of the fits warm bathing and antispasmodics should be resorted to. The distemper is generally contagious, and occurs but once in a lifetime.

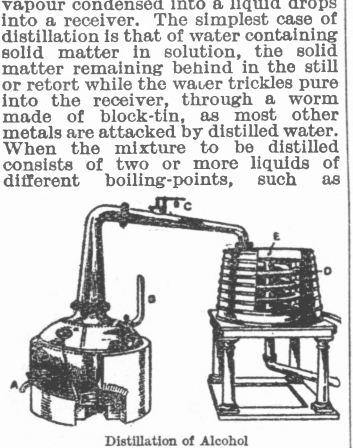
DISTEMPER (It. *tempera*). In painting, a preparation of colour mixed with size, yolk of egg or white of egg. Prepared with size, it is used chiefly in scene painting and household decorations, but in other forms it is much used for easel and mural paintings. Before the introduction of oil as a medium in the fifteenth century, fresco and distemper were the principal methods of painting. Distemper is usually but not necessarily applied to a dry ground, fresco always to a wet.

DISTICH (dis'tik). A couplet of verses, especially one consisting of a Latin or Greek hexameter and pentameter, making complete sense. Distichs have been frequently made use of by the modern German poets.

DISTILLATION. The volatilization and subsequent condensation of a liquid in an apparatus known as a *still* and heated by a fire or flame. The operation is performed by heating the crude liquid or mixture in a retort or vessel known as the *body of the still*. This is made of various shapes and materials, and is closed, with the exception of a slender neck which opens into the condenser, a long tube through which the hot vapour from the still is passed. The tube is

kept at a sufficiently low temperature to cause the vapour to condense, the common method of securing this being to surround the tube with a constantly renewed stream of cold water. In some cases ice or a freezing mixture may be required to effect condensation.

In a large-scale apparatus the condensing tube is coiled round and round in a tub or box, and is known as a *worm*. From the end of it the vapour condensed into a liquid drops into a receiver. The simplest case of distillation is that of water containing solid matter in solution, the solid matter remaining behind in the still or retort while the water trickles pure into the receiver, through a worm made of block-tin, as most other metals are attacked by distilled water. When the mixture to be distilled consists of two or more liquids of different boiling-points, such as



Distillation of Alcohol

A, Emptying pipe. B, Wash inlet. C, Vacuum safety valve D, Worm. E, Cooling water inlet.

alcohol and water, the more volatile comes off first, accompanied by a certain proportion of the vapour of the other, so that it is hardly possible completely to separate bodies by one distillation. This is effected by repeated successive distillations of the liquid with or without the addition of substances to retain the impurities. When the production of one of the ingredients only is aimed at by this process, it is called *rectification*, but when it is desired to separate and collect all the liquids present, or to divide a mixture into portions which volatilize within certain ranges of temperature, the process is called *fractional distillation*.

In the laboratory, distillation is employed for purifying water, for recovering alcohol and ether, and for the preparation, purification, and separation of a great number of bodies. Substances which decompose at their boiling-points can be distilled under reduced pressure. On the large scale distillation is employed in the preparation of potassium, sodium, zinc, mercury; of sulphuric acid, ether, chloroform, carbon bisulphide, essential oils and perfumes; in the purification of coal and wood tar, and the products obtained from them; and on an extensive scale in the manufacture of whisky, brandy, or other spirit.

The distillation of whisky has long been familiar in Britain, especially in Scotland and Ireland, and, when performed by means of the old *pot-still*, is a simple operation indeed, and one that even yet is practised surreptitiously in out-of-the-way localities. On the large scale a more elaborate apparatus is employed, and for alcohol of a cheap class Coffey's or other patent still is much used. Copper is the metal that suits best as the material for the stills used in distilling whisky. Sea-water is distilled in many cases for drinking or cooking purposes. This water is, of course, very pure, but its taste is far from agreeable.

Destructive distillation, or **dry distillation,** differs from the preceding in this respect, that the original substance is not merely broken up into bodies by the mixture of which it is formed, but is so treated that it is further decomposed, and products are obtained which were not present uncombined in the original material. (*See* COAL-TAR.) The term is restricted to the action of heat upon complex organic substances out of contact with the air. The products of destructive distillation are numerous and varied.

On the manufacturing scale the process is conducted sometimes for the sake of one part of the products, sometimes for the sake of another. Coal, for example, may be distilled not solely for the gas, but also for ammoniacal water, benzene, anthracene, as well as for the sake of the fixed carbon or coke, the volatile portions being too often neglected and practically wasted. But much more economical methods of making coke are now practised than formerly.

Wood is distilled partly for the sake of the pyroligneous acid and the tar, partly for the charcoal. Bones are distilled for the sake of the charcoal, though the oil is also collected. Shale is distilled both for the oil and for the paraffin wax, ammonia, etc., obtained.

DISTINGUISHED CONDUCT MEDAL. A medal instituted in 1854 under the name of the Meritorious Service Medal as "a mark of the Sovereign's sense of the distinguished service and gallant conduct in the field of the army then serving in the Crimea." The regulations concerning this medal were revised in 1862, when

it received its present name. It is given to warrant-officers, non-commissioned officers, and privates. As from the 1st Aug., 1918, the medal is awarded for services in action only.

Distinguished Conduct Medal

The medal is silver, 1·4 inches in diameter; on the obverse is the Sovereign's head, and on the reverse the inscription "For Distinguished Conduct in the Field." It is suspended from a ribbon 1¼ inches wide, crimson, blue, and crimson, the colours being of equal width. Bars may be awarded for additional deeds of gallantry; in service uniform the possession of a bar is indicated by a silver rosette worn on the ribbon. The letters D.C.M. are placed after the name of the recipient, who receives either a gratuity of £20 on discharge, or an increase in pay of 6d. per day.

DISTINGUISHED FLYING CROSS. A decoration instituted during the European War, and awarded to officers and warrant-officers of the Air Force for acts of gallantry when flying in active operations against the enemy. The ribbon is 1¼ inches wide, and has narrow purple and white alternate diagonal stripes. The letters D.F.C. are placed after the name of the recipient. A corresponding medal, the Distinguished Flying Medal, is awarded to non-commissioned officers and men.

Distinguished Flying Cross (obverse)

Distinguished Flying Medal (obverse)

DISTINGUISHED SERVICE CROSS. A naval decoration formerly known as the Conspicuous Service Cross, and instituted in 1901. It is awarded to naval officers below the rank of

Distinguished Service Cross (obverse)

lieutenant-commander, and to warrant-officers, for services before the enemy. The ribbon is dark-blue, white, and dark-blue, in stripes of equal width. The letters D.S.C. are placed after the name of the recipient.

DISTINGUISHED SERVICE ORDER. Was instituted by Royal Warrant on 6th Sept., 1886. All commissioned officers of the Navy, Army, or Air Force are eligible to be appointed Companions of this Order. It is conferred upon officers who have

Distinguished Service Order (obverse)

been specially mentioned in dispatches for meritorious or distinguished services. Towards the end of the European War (1st Aug., 1918) it was decided that this decoration was only to be given for services in action, i.e. (1) for service under fire, or (2) distinguished individual service in connection with air-raids, bombardments, or other enemy action. Bars may be awarded for additional deeds of gallantry; in undress uniform the possession of a bar is in-

dicated by a silver rosette worn on the ribbon. The ribbon is red, edged with blue, and is 1 inch wide. It is the same as the ribbon of the Waterloo and Peninsular medals, only narrower.

The badge of the order is a gold cross *patée* enamelled white, edged gold, having on one side thereof, in the centre, within a wreath of laurels enamelled green, the Imperial Crown in gold, upon a red enamelled ground, and on the reverse, within a similar wreath and on a similar red ground, the Imperial and Royal cipher (G.R.I.). The letters D.S.O. are placed after the name of the recipient, who ranks between Commanders of the Order of the British Empire and Members of the Royal Victorian Order (4th class).

DISTRAINT. Method of enforcing payment of a debt. The usual method is for the creditor to sue the debtor, and, having proved his debt, to obtain an order calling upon the debtor to pay; if he fails to do this the creditor can send the bailiffs to his house, or business, and sell his goods. At one time the goods of a lodger could be seized for the debts of his landlord, but this was forbidden by law in 1908.

Arrears of rent are often obtained by a distraint. Before the passing of the Rent Restriction Act during the war period, a landlord could distrain without applying to the court. Under the Rent Restriction Acts an order of the court is necessary before this can be done. If a tenant removes his goods the landlord can distrain upon them wherever they are within 30 days.

DISTRESS' (Lat. *distringere*, pull asunder). In law, is the taking of a personal chattel of a wrong-doer or a tenant, in order to obtain satisfaction for the wrong done, or for rent or service due. If the party whose goods are seized disputes the injury, service, duty, or rent, on account of which the distress is taken, he may replevy the things taken, giving bonds to return them or pay damage in case the party making the distress shows that the wrong has been done, or the service or rent is due. Wrongful distress is actionable. Another kind of distress is that of *attachment*, to compel a party to appear before a court when summoned. The distresses most frequently made are on account of rent and taxes and *damage-feasance*.—Cf. Blackstone, *Commentaries on the Laws of England*.

DISTRICT. Defined portion of territory. Such is the District of Columbia, which includes Washington, in the United States. In England there are two kinds of district, urban and rural, each with an elected council, and controlled to some extent by the county councils. Urban councils, especially those with over 20,000 inhabitants, have much more extensive powers than the rural ones. The councils were set up in 1894.

Ireland had councils on the same plan. In Scotland the counties are divided into districts and district councils were set up by a law passed in 1929.

A district registry is an office where wills can be proved. There are about 40 of them in the large towns of England and Wales.

DISTRICT COURTS. An important series of courts in the United States, each under a single judge, and having original jurisdiction in civil, criminal, and admiralty causes. Generally there is one for each state. By the Judiciary Code, enacted by Congress in 1911, the circuit courts, which had hitherto shared original jurisdiction with the district courts, became only appellate tribunals.

DISTRINGAS (Lat., that you distrain). A notice proceeding upon an affidavit filed in the High Court by a party not the registered holder of shares or stock but beneficially interested therein, and served upon the particular company or public body, whereby it is precluded from registering any transfer of the shares or stock or any mandate for payment of the dividends without previous intimation to such party. The latter had thus the opportunity, if desired, to apply for an interim injunction, and, should he not do so within eight days from the date upon which the transfer or mandate was lodged, the restraint flies off.

DITHYRAM'BUS, or DITH'YRAMB. In Greek literature, a poem sung in honour of the god Bacchus or Dionysus, at his festivals. The choral portion of Greek tragedy arose out of the dithyramb. It was composed in a lofty and often inflated style: hence the term is applied to any poem of an impetuous and irregular character.

DITMARSHES (Ger. *Dithmarschen*). A district of Holstein, in Germany, consisting of a monotonous flat stretching along the North Sea, between the mouths of the Elbe and the Eider, and so little raised above the sea as to require the protection of strong embankments. Ditmarshes was incorporated in Prussia in 1866. The area is 500 sq. miles, and the total pop. 98,000.

DIU. A small island, 7 miles long, on the south coast of Kathiawar, India. It belongs to the Portuguese

dependency of Goa, and was formerly of great importance. The inhabitants (14,000) are mostly fishermen, though in the town of Diu there are several salt-works.

DIURET'ICS. Are agents used to increase the flow of urine. Many drugs are used for this purpose: caffeine and theobromine, digitalis and squills, potassium salts, carbonates, calomel and blue pill.

DIVAN'. A Persian word having several significations. It is used in Turkey for the highest Council of State, the Turkish ministry; and for a large hall for the reception of visitors. Low couches, covered with rich carpets and cushions, are ranged along the walls of the room. Hence in Western Europe the term is applied to a café, and to a kind of cushioned seat. In India the term is applied to the Prime Minister of a native State. Among several Oriental nations this name is given to certain collections of lyric poems by one author. The *divans* of Hafiz and Saadi, the Persian poets, are important.

DIVERS. Birds remarkable for the habit of diving. The divers (Colymbidæ) are a family of swimming birds, characterized by a strong, straight, rather compressed pointed bill about as long as the head; a short and rounded tail; short wings; thin, compressed legs, placed very far back, and the toes completely webbed. They prey upon fish, which they pursue under water, making use partly of their wings, but chiefly of their legs and webbed feet in their subaqueous progression. The leading species are the great northern diver (*Colymbus glaciālis*), the red-throated diver (*C. septentrionālis*), and the black-throated diver (*C. arcticus*). These birds inhabit the Arctic seas of the New and Old Worlds; they are abundant in the Hebrides, Norway, Sweden, and Russia. The great northern diver, loon, or ember goose is about 2½ feet long, and is of handsome plumage.

DIV'IDEND. Literally what is to be divided, a term used in arithmetic and in reference to stocks. In the latter sense it is the interest or profit of stocks divided among, and paid to, the proprietors. No dividend must be paid except out of profit (Companies Act of 1862). The term also signifies the payment made to creditors out of the estate of a bankrupt.

DIVIDING RANGE, Great. An Australian chain of mountains, forming the watershed between the rivers flowing into the Pacific and those running westward. It is situated at an average distance of 30 miles from the sea, though in some places it recedes as much as 60 miles, and stretches from Cape York on the north to Wilson's Promontory on the south. The culminating point is Mount Townshend (7353 feet).

DIVI-DIVI. The pods of *Cæsalpinia coriaria*, a tree which grows in tropical America, and a member of the family which yields sapan, brazil, and other red woods. The pods are about 1 inch broad and 3 inches long, but are generally bent or curled up; are excessively astringent, containing a large proportion of tannic and gallic acid, for which reason they are used by tanners and dyers.

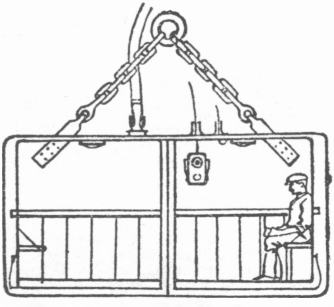
DIVINATION. The act of divining; a foretelling future events, or discovering things secret or obscure, by the aid of superior beings, or by other than human means. Cicero divided it into two kinds, *natural* and *artificial*, or *intuitive* and *inductive*. *Natural* divination was supposed to be effected by a kind of inspiration or divine afflatus; this method of divination is familiar as represented by oracles; *artificial* divination was effected by certain rites, experiments, or observations, as by sacrifices, observation of entrails and flight of birds (ornithomancy), of the behaviour of fishes (ichthyomancy), lots, omens, and position of the stars. Among modes of divination were: *axinomancy*, by axes; *belomancy*, by arrows; *bibliomancy*, by the Bible; *oneiromancy*, by dreams; *pyromancy*, by fire; *hydromancy*, by water; *coscinomancy*, by observing the results of the turning of a sieve hung on a thread. Cf. Bouché-Leclercq, *Histoire de la divination dans l'antiquité*.

DIVINE RIGHT. The claim set up by some sovereigns or their supporters to the absolute obedience of subjects as ruling by appointment of God, insomuch that, although they may themselves submit to restrictions on their authority, yet subjects endeavouring to enforce those restrictions by resistance to their sovereign's acts are considered guilty of a sin. This doctrine, which came into general use in the seventeenth century, and is so celebrated in English constitutional history, especially in the time of the Stuarts, may now be considered to be exploded. Hobbes was one of the chief supporters of the theory of Divine Right, whilst Milton was a strong opponent. Cf. J. N. Figgis, *Theory of the Divine Right of Kings*.

DIVING. The art or act of descending into the water to considerable depths, and remaining there for a time. The uses of diving are important, particularly in searching for

pearls, corals, sponges, examining foundations of bridges, salvage of wrecked ships, recovering valuables, clearing propellers, valves, and cleaning bottoms of ships when no dry docks are available. Without the aid of artificial appliances a skilful diver may remain under water for two, or even three minutes; accounts of longer periods are doubtful or absurd. Various methods have been proposed, and engines contrived, to render diving more safe and easy. The great object in all these is to furnish the diver with fresh air, without which he must either make but a short stay under water or perish.

DIVING-BELL. A contrivance for the purpose of enabling persons to descend and to remain below the surface of the water for a length of time, for various purposes, such as laying foundations of bridges, blasting rocks, and recovering treasure from sunken



Diving-Bell, used for working under water

ships. Diving-bells have been made of various forms, more especially in that of a bell or hollow truncated cone, with the smaller end closed, and the large one, which is placed lowermost, open. The air contained within these vessels prevents them from being filled with water on submersion, so that the diver may descend in them and breathe freely for a long time, provided he can be furnished with a new supply of fresh air when the contained air becomes vitiated by respiration.

The diving-bell is usually made of cast iron, and weighted, and has several strong convex lenses set in the sides or roof, to admit light to the persons inside. It is suspended by chains from a barge or lighter, and can be raised or lowered at pleasure upon signals being given by the persons within, who are supplied with fresh air pumped into a flexible pipe by means of force-pumps carried in the lighter, while the heated air escapes by a cock in the upper part of the bell. Modern diving-bells are usually rectangular in shape, and have a trunk or tube on top reaching to the surface of the water, and fitted with an air-lock to enable men to go into or out of the bell without moving it from the bottom; they are fitted with telephones and electric lights. A constant flow of fresh air is kept up, and all excess of air escapes from the lower part of the bell, the pressure of the air being kept slightly above that of the water outside.

The diving-bell has long been found highly useful for carrying on work under water, a steam-crane being usually employed for the movements required. A form, called the *nautilus*, has been invented which enables the occupants, and not the attendants above, to raise or lower the bell, move it about at pleasure, or raise great weights with it and deposit them in any desired spot.

DIVING-DRESS. A waterproof dress of india-rubber cloth used by professional divers, and covering the entire body except the head. The dress has a neck-piece or breast-plate, fitted with a segmental screw bayonet joint, to which the head-piece or helmet, the neck of which has a corresponding screw, can be attached when wanted. The helmet has usually three eyeholes, covered with strong glass, and protected with guards. Air is supplied by means of a flexible air-pipe which screws on to a non-return valve on the helmet, and is connected with an air-pump on the surface. To allow of the escape of excess air a valve is fitted in the helmet, so constructed as to prevent water getting in, though it lets the air out. It can be adjusted by the diver to suit his convenience, no matter at what depth he may be.

Leaden weights are attached to the diver, and his boots are weighted, so that he can descend a ladder and walk about on the bottom. Communication can be carried on with those above by signals on the breast-rope between the diver and his attendant, or he may converse with them through a speaking-tube or by telephone, which is usually fitted in the breast-rope.

One form of diving-dress makes the diver independent of any connection with persons above water except by breast-rope. It is elastic and hermetically closed. A reservoir containing highly compressed air is fixed on the diver's back. This supplies him with air by a self-regulating apparatus at a pressure corresponding to his depth. When he wishes to ascend, he simply inflates his dress from the reservoir.

Another form, known as the Fleuss dress, also makes the diver independent of exterior aid. The helmet contains a supply of compressed oxygen, and the exhaled breath is passed through a filter in the breast-piece which deprives it of its carbonic acid, while the nitrogen goes back into the helmet to be mixed with the oxygen, the supply of which is under the diver's own control, and to be breathed over again. A diver has remained for an hour and a half under 35 feet of water in this dress.

The safe limit for diving is 200 to 300 feet, the deepest dive in this country being 210 feet; but great care must be exercised in bringing the diver to the surface. Diving for pearls, sponges, valuables, etc., is now to a great extent carried on by means of diving-dresses.—BIBLIOGRAPHY: C. W. Domville-Fife, *Submarine Engineering of To-day*; G. W. M. Boycott, *Compressed Air Work and Diving*.

DIVINING ROD. A rod, usually of hazel, with two forked branches, used by persons who profess to discover minerals or water under ground. The rod, if carried slowly along by the forked ends, dips and points downwards, it is affirmed, when brought over the spot where the concealed mineral or water is to be found. Divination by means of rods is of great antiquity, and has been described by Cicero and Tacitus; their rods, however, were short bits of stick, and the forked hazel twig does not seem to have come into use before the early sixteenth century. Dr. H. Mayo gave a collection of discoveries made by it in his work *On the Truth contained in Popular Superstitions* (1847-51). The use of the divining rod is still common in many parts.—Cf. P. L. L. de Vallemont, *La Physique Occulte: ou Traité de la baguette divinatoire*.

DIVISIBIL'ITY. That general property of bodies by which their parts or component particles are capable of separation. The study of radio-activity has shown that larger atoms may be broken up into smaller ones, and the old conception of the atom as an absolutely indivisible unit is no longer entertained by physicists. (*See* MATTER.) Numerous examples of the division of matter to a degree almost exceeding belief may be easily instanced. Thus glass test-plates for microscopes have been ruled so fine as to have 225,000 spaces to the inch. Cotton yarn has been spun so fine that one pound of it extended upwards of 1000 miles, and a Manchester spinner is said to have attained such a marvellous fineness that one pound would extend 4770 miles. One grain of gold has been beaten out to a surface of 52 sq. inches, and leaves have been made 367,500 of which would go to the inch of thickness.

Iron has been reduced to wonderfully thin sheets. Fine tissue paper is about the 1200th part of an inch in thickness, but sheets of iron have been rolled much thinner than this, and as fine as the 4800th part of an inch in thickness. Wires of platinum have been drawn out so fine as to be only the 30,000th part of an inch in diameter. Human hair varies in thickness from the 250th to the 600th part of an inch. The fibre of the coarsest wool is about the 500th part of an inch in diameter, and that of the finest only the 1500th part. The silk line, as spun by the worm, is about the 5000th part of an inch thick; but a spider's line is only the 30,000th part of an inch in diameter; insomuch that a single pound of this attenuated substance might be sufficient to encompass our globe. The trituration and levigation of powders, and the perennial abrasion and waste of the surface of solid bodies, occasion a disintegration of particles almost exceeding the powers of computation. The solutions of certain saline bodies, and of other coloured substances, also exhibit a prodigious subdivision of matter.

A single grain of sulphate of copper, or blue vitriol, will communicate a fine azure tint to five gallons of water. In this case the sulphate must be attenuated at least 10,000,000 times. Odours are capable of a much wider diffusion. A single grain of musk has been known to perfume a large room for the space of twenty years. At the lowest computation the musk had been subdivided into 320 quadrillions of particles, each of them capable of affecting the olfactory organs.

DIVISION. In the army, the smallest formation of troops which is a mixed force. A division, besides three brigades of infantry, includes artillery, engineers, and administrative troops. It is commanded by a major-general, and if at full strength consists of about 20,000 men.

DIVISION. In Parliament, the mode of determining a question at the end of a debate. In the House of Commons the Speaker puts the question, and declares whether in his opinion the "Ayes" or the "Noes" have it. Should his opinion not be acquiesced in by the minority, the House is cleared, and the "Ayes" directed to go into the right lobby and the "Noes" into the left, where they are counted by two tellers ap-

pointed for each party. In the House of Lords the two sides in a division are called "Contents" and "Non-contents."

DIVISION OF LABOUR. A method employed in productive undertakings for the simplifying of the work to be done by each of the workmen engaged therein. The separation of the process of production into a series of simple operations means that less ability on the part of the workman is required in order that he may acquire the necessary skill in performing any particular operation, and saves much time, partly because practice leads to each operation being more quickly performed, and partly by avoiding the waste which takes place in workmen moving from one operation to another. Owing to both of these causes, the cost of producing complicated articles may be immensely reduced.

By standardizing operations division of labour tends to the invention of machinery; increases the skill and dexterity of the individual workman in the particular operation in which he is engaged; enables semi-skilled or unskilled labour to replace skilled; makes a more continuous and economical use of capital possible; and conduces to the more economical distribution of labour by classing workpeople according to their capacity. It has, however, a deteriorating effect on the labourer's usefulness as an all-round workman, and is liable to kill his interest in his work, thereby reducing the incentive to industry. What is called division of labour in English economics has been sometimes termed *co-operation* by foreign economists.

DIVORCE (Lat. *divortium*, from *divertere*, to turn apart, separate). A separation, by law, of husband and wife, which is either a divorce *a vinculo matrimonii*, that is, a complete dissolution of the marriage bonds, or a divorce *a mensâ et thoro* (from bed and board), whereby the parties are legally separated, but not unmarried. The causes admitted by different codes of laws as grounds for the modification or entire dissolution of the marriage contract, as well as the description of tribunal which has jurisdiction of the proceedings, and the form of the proceedings, are various.

Divorce was permitted by the law of Moses, but forbidden in the New Testament, except for adultery. The early laws of Rome permitted the husband to divorce his wife for adultery and many other alleged offences. The facility of divorce continued, without restriction, under the Roman emperors, but as the modern nations of Europe emerged from the ruins of the Roman Empire, they adopted the doctrine of the New Testament. Marriage, under the Roman Church, instead of a civil contract, came to be considered a sacrament of the Church, which it was unlawful to dissolve. The ecclesiastical courts could indeed annul a marriage, but only for a cause that existed at the time the marriage was contracted, such as prior contracts or impotency.

For any cause arising after marriage they could only pronounce a divorce *a mensâ et thoro*, which did not leave either party free to marry again, except by Papal dispensation. A divorce *a vinculo matrimonii*, for any cause arising subsequent to marriage, could formerly be obtained in England only by an Act of Parliament, and the ecclesiastical courts must have previously pronounced a divorce *a mensâ et thoro*. The Act passed in 1857, however, established a new court for trying divorce causes, called the Court for Divorce and Matrimonial Causes, since absorbed into the Probate, Divorce, and Admiralty Division of the High Court of Justice.

In 1923 a law was passed which made the sexes equal in this matter. Adultery is now a ground for divorce by both husband and wife. If the case is proved the court grants a decree nisi (unless). If, at the end of six months, the parties concerned have not broken the law, the decree is made absolute, and they are free to marry again. Poor persons desiring a divorce on good grounds can obtain assistance from the Law Society, Chancery Lane, London, W.C.2.

There is a movement to make divorce still easier to obtain, in cases of insanity or serious mental trouble, for instance, and a Divorce Law Reform Union exists at 55-56 Chancery Lane, London, W.C., to urge such reforms.

In other countries, including British colonies, the law relating to divorce varies greatly. In the United States of America, marriage, though it may be celebrated before clergymen as well as civil magistrates, is considered to be a civil contract, and the laws as to divorce, and the facility or difficulty of obtaining it, differ greatly in the several states. In France divorce was legalized in 1884, with conditions, after having been prohibited for many years.—BIBLIOGRAPHY: Lehr, *Le mariage, le divorce et la séparation de corps dans les principaux peuples civilisés*; Stephen, *Commentaries on the Laws of England*; Bryce, *Marriage and Divorce*.

DIXMUDE. A town of Belgium, in Flanders. It was the scene of severe fighting during the European War. Captured by the Germans, it was retaken by the Belgians on 29th Sept., 1918. Pop. 4040 (1911); 3075 (1927).

DIZFUL. A town of Persia, near the western boundary, on the River Dizful; a place of great trade and manufactures. Pop. 30,000.

DJEMAL PASHA (1861-1922). Turkish politician, and one of the leaders of the Committee of Union and Progress. Minister of Marine in 1914, he commanded the Turkish forces in Palestine from 1915 to 1917, and became notorious on account of his oppression of and cruelties against the inhabitants of Syria and Palestine, and by his hatred of Zionism. Accused in 1918 of various crimes, such as misappropriation of funds, and compelled to flee from Constantinople, he was condemned to death in his absence in 1919. He was nevertheless one of the Turkish delegates who signed the Peace Treaty on 11th May, 1920.

DJOKDJOKARTA. A Dutch residency in the Island of Java, on the south coast, with a capital of the same name. Its forests abound in teak. Its natural fertility is great, and rice, coffee, and tobacco are extensively cultivated. It is ruled by a sultan who is dependent on the Dutch. Area, 1200 sq. miles; pop. 850,000. The town is large and regular, and contains the sultan's water-palace, and the seat of the Dutch Resident, which is a fort commanding both the palace and the town. Pop. about 100,000.

DNIEPER (nē'pĕr; Russ. *Dnjepr*, dnyepr; anciently **BORYSTHENES**, or **DANAPRIS**). A great river of Russia which rises in the government of Smolensk, flows first south-west, then south-east, and again south-west to the Black Sea. It begins to be navigable a little above Smolensk, and has a total length, including windings, of 1400 miles. Among its tributaries are the Beresina, the Pripet, the Desna, and the Psiol.

In its lower course there are important fisheries. The region watered by the river in its lower course is famous for its great fertility and is known as the *black-soil*. Between Kiev and Alexandrovsk it forms a series of cataracts. Since 1838 there have been steamboats on the river, and the trade carried by it is considerable. Through the Beresina Canal the Dnieper communicates with the Baltic Sea.

DNIESTER (nēs'tĕr; Russ. *Dnjestr*; ancient **TYRAS**). A large river of Europe (Poland, Rumania, and Ukraine), which has its source in the Carpathian Mountains, in Austrian Galicia, enters Russia at Chotin, and empties itself into the Black Sea after a course of about 750 miles. Its navigation is difficult on account of frequent shallows and rapids.

DOAB' (that is, *Two Waters*). A name in India applied indiscriminately to any tract of country between two rivers, like the Greek *Mesopotamia*. The tract between the Ganges and the Jumna is usually called *the* Doab; other similar tracts have their distinctive names, the Punjab being divided into five districts of this kind.

DÖBELN (*deu'*beln). A town of Saxony, about 40 miles south-east of Leipzig, with a great trade in grain, and manufactures of cloth, yarn, leather, and lacquered wares. Pop. 22,560.

DOBRICIH, or **BAZARJIK.** A town in Rumania, was, till the end of the second Balkan War, the chief town in Bulgarian Dobrudja. It is situated on a small tributary of the Danube, and is on the Cernavoda-Constantsa railway. At one time it was famous for its panair or great annual fair, but it is now no longer an important centre. Pop. 29,938.

DOBRUDJA, or **DOBRUD'SCHA, The** (anciently **SCYTHIA MINOR**). A territory forming part of the kingdom of Rumania, included between the Danube, which forms its boundary on the west and north, the Black Sea on the east, and Bulgaria (to which it belonged before 1878) on the south. Its area, formerly 6000 sq. miles, was increased by the Treaty of Bucharest of 10th Aug., 1913, and is now 8969 sq. miles. During the European War the Dobrudja was invaded in 1916 by an army of Germans, Bulgarians, and Turks, under General von Mackensen. In 1918 Rumania was compelled by the Treaty of Bucharest to cede the Dobrudja to Bulgaria, but it was restored to her in 1919.

There are some fertile spots, but on the whole it is marshy and unhealthy. The population is of various nationalities, Rumanians, Bulgars, Greeks, Turks, and Jews. The inhabitants engage in tillage and stock-rearing. The principal towns are Constanta and Tulcea. *See* RUMANIA. Pop. 700,000.

DOBSON, Henry Austin. Poet, born at Plymouth in 1840. He was educated at Beaumaris, Coventry, and Strasbourg; in 1856 obtained a clerkship under the Board of Trade, where he rose to be one of the officials known as principals.

Verses. His earliest verses first ppeared in book form under the title *'ignettes in Rhyme and Vers de 'ociété* (1873). His other volumes of erse include : *Proverbs in Porcelain* 1877); *Old World Idylls* (1883); nd *At the Sign of the Lyre* (1885), vhich *The Athenæum* pronounced to e " of its kind as nearly as possible erfect."

Prose Works. Among his prose vorks may be mentioned his lives of *Hogarth, Fielding, Steele, Goldsmith, Horace Walpole, Richardson,* and *Fanny Burney*; *Thomas Bewick and his Pupils*; *Four Frenchwomen*, a tudy on Charlotte Corday, the Princesse de Lamballe, and Mesdames Roland and de Genlis; three series of *Eighteenth Century Vignettes*; *A Paladin of Philanthropy*; *Sidewalk Studies*; *Old Kensington Palace*; *At Prior Park*; *A Bookman's Budget*; and several editions of standard works. His collected poems were published in one volume in 1897. Many of Mr. Dobson's poems are written in various French forms, such as the rondeau and ballade, and all are marked by gracefulness and ease. He died in Sept., 1921.

DOCK. A name applied to different plants of the genus Rumex, belonging to the rhubarb family (Polygonaceæ). These are large herbaceous plants, with stout roots, alternate and often entire leaves, and bearing panicles of small greenish flowers. They are very troublesome as weeds, but the roots of some of them are used medicinally as astringents.

DOCKS. Are artificial enclosures for the reception of shipping, for the purpose of loading, discharging, or repairs. They may be divided into four types, viz. tidal docks or basins, wet docks, dry or graving docks, and floating docks.

Tidal Docks or Basins are open permanently to the main channel or river, and the water-level therefore varies with the rise and fall of the tide. This variation of level is a serious hindrance in the work of loading or discharging cargo, unless the tidal range be small. It should be noted that this form is more properly termed a tidal basin.

Wet Docks have a water entrance normally closed by gates or caissons, which permit the water-level of the enclosed area being maintained at high-water level. This uniformity of level is of great service in dealing with cargo, but this type has the disadvantage of only permitting traffic in and out of the dock at high water. This disadvantage may be modified by the provision of a lock at the dock entrance.

Dry or Graving Docks are used for the purpose of examining and repairing ships. The entrance is controlled by either gates or caissons. The ship having entered, the gates are closed, and the water pumped out, allowing the vessel to settle down gradually upon a row of keel blocks, running up the centre line of the dock. The sides of the docks are built in the form of large continuous steps or " altars," which support the ends of the timber shores which serve to keep the ship in an upright position. The floor is graded to channels, leading to powerful pumps, usually of the centrifugal type, and capable of emptying a large dock in one hour.

Floating Docks fulfil the same functions as dry docks. In their modern form, they consist of a hollow steel box or pontoon, carrying hollow longitudinal walls at each side. These walls contain the pumps and controlling machinery, the pontoon portion being capable of being filled with or emptied of water, thus raising or sinking the dock. This lower portion is subdivided into a great number of compartments, all of which may be filled separately, so that errors of trim can be corrected. In making use of this type the dock is lowered by flooding the lower compartments. The ship is then floated into position and shored.

The initial cost of these two latter types is in favour of the floating dock, the annual maintenance charges of which, however, may be five to ten times those of an ordinary masonry dock. The mobility of a floating dock may be considered an advantage, allowing it to be easily removed to another locality to meet changing conditions, but this adaptability should not be overvalued.

The average life of a steel dock may be assumed to be 40 years, whereas a masonry dock may be said to last indefinitely.

The first wet docks constructed in England were those now called the Commercial Docks, in London, which existed in a much less extensive form so early as 1660. In 1800 the West India Docks were constructed, and were followed by the East India Docks, Millwall Docks, London Docks, the St. Katharine Docks, and the Victoria Docks, affording, together with those at Tilbury, more than 600 acres of water accommodation, besides wharf and warehouse grounds, where all kinds of appliances and machinery for the speedy and convenient transfer of goods and cargoes are in use. Some of the warehouses are extremely capacious, the tobacco warehouse of the London Docks being itself nearly 5 acres in extent. Next

after the London docks come those of Liverpool, which extend more than 6 miles along the north bank of the Mersey, and cover, together with the Birkenhead docks, nearly as large a total acreage as those of London.

The other important British docks are those at Southampton, Bristol, Cardiff, Hull, Great Grimsby, Newcastle, Shields, Barrow, Leith, Glasgow, Dundee, etc. A floating dock at Hamburg has a length of 728 feet, inside width of 123 feet, and a lifting capacity of 46,000 tons, and one at Southampton has a capacity of 60,000 tons.—BIBLIOGRAPHY: W. Shields, *Principles and Practice of Harbour Construction*; L. V. Harcourt, *Harbours and Docks*.

DOCK-YARDS. Establishments supplied with all sorts of naval stores, materials and conveniences for the construction, repairs, and equipment of ships of war. In England the royal dock-yards are at Chatham, Sheerness, Portsmouth, Devonport, and Pembroke, besides the Deptford and Woolwich storeyards. There are also royal dock-yards or naval victualling yards at Haulbowline in Cork Harbour, Rosyth, Invergordon, at the Cape of Good Hope, Gibralter, Malta, Bermuda, Bombay, Calcutta, Hong-Kong, Sydney, and Wei-hai-wei. Others in the colonies have been given up. The dock-yards are under the direct control of the Admiralty.

The chief officer of the greater or home dock-yards is generally an admiral, with a considerable staff of officials under him, professional and other. Since the introduction of steam the engineering department has become an important one in such establishments.

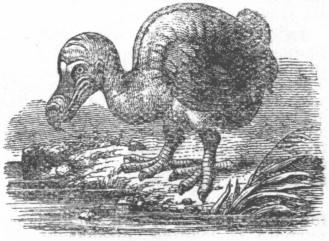
DOCTORS' COMMONS. Was a college founded in 1567 for the Doctors of the Civil Law in London, and was at one time the seat of the Court of Arches, the Archdeacon's Court, and the Court of Admiralty. The practitioners in these courts were called advocates and proctors. In 1857 an Act was passed empowering the college to sell its property and dissolve, and making the privileges of the doctors common to all solicitors.

DODDER. The common name of the plants of the genus Cuscŭta, a group of slender, branched, twining, leafless pink or white annual parasites, nat. ord. Convolvulaceæ. The seeds germinate on the ground, but the young plant speedily attaches itself to some other plant, from which it derives all its nourishment. Four species are common in England—*C. europœa*, found on nettles and vetches; *C. Epithymum*, on furze, thyme, and heather (these two being natives); *C. trifolii*, on clover; *C. Epilinum*, on cultivated flax (both introduced from abroad).

DODECANESE (Gr., twelve islands). A name applied since the Turko-Italian War of 1912-3 to a group of islands lying off the south-west coast of Asia Minor, the base of the Italian troops. The group, consisting of the Southern Sporades, includes the Islands of Patmos, Cos, Lipsos, and others near Rhodes. Italy agreed to restore the islands to Turkey, but was prevented from carrying out the agreement by the breaking out of the Balkan War. By the Treaty of Lausanne (1923) Italian possession of those islands was confirmed, though Greece still maintains her claim.

DODGSON, Charles Lutwidge. *See* CARROLL, LEWIS.

DODO (*Didus ineptus*). An extinct genus of birds once abundant on the Island of Mauritius, and assigned by naturalists to the ord. Columbæ or pigeons, though an extreme modification of the type. It was a massive



Dodo

clumsy bird, larger than a swan, covered with down instead of feathers, with short ill-shaped legs, a strong bulky hooked beak, and wings and tail so short as to be useless for flight. Its extinction was due to its organization not being adapted to the new conditions which colonization and cultivation introduced. It probably became extinct soon after 1681.

DODO'NA. A celebrated locality of ancient Greece, in Epirus, where was one of the most ancient Greek oracles. It was a seat of Zeus (surnamed the Pelasgian), whose communications were announced to the priestesses in the rustling of the leaves on its oak tree, and the murmuring of water which gushed forth from the earth.

DOE, John, and Richard Roe. Two fictitious personages of the English law who formerly appeared in a suit of ejectment. This fictitious form of procedure was abolished in 1852.

DOG (*Canis familiaris*). A digitigrade, carnivorous animal, forming he type of the genus Canis, which ncludes also the wolf, the jackal, and he fox. The origin of the dog is a nuch-debated question. The original tock is unknown, but various species of wolf and jackal have been suggested as ancestors. Probably a number of wild types were domesticated by prehistoric man, and there has been a good deal of crossing between these different stocks. It is generally agreed that no trace of the dog is to be found in a primitive state, the dhole of India and dingo of Australia being believed to be wild descendants from domesticated ancestors. Several attempts to make a systematic classification of the varieties of dogs have been made, but without much success, it being difficult in many cases to determine what are to be regarded as types, and what as merely mongrels and cross-breeds.

Colonel Hamilton Smith divides dogs into six groups as follows: (1) *Wolf-dogs*, including the Newfoundland, Esquimaux, St. Bernard, shepherd's dog, etc.; (2) *Watch-dogs* and *Cattle-dogs*, including the German boar-hound, the Danish dog, the matin dog, etc.; (3) *Greyhounds*, the lurcher, Irish hound, etc.; (4) *Hounds*, the bloodhound, staghound, foxhound, setter, pointer, spaniel, cocker, poodle, etc.; (5) *Terriers* and their allies; (6) *Mastiffs*, including the different kinds of mastiffs, bull-dog, pug-dog, etc. (*See* the different articles.)

On each side of the upper jaw are three incisors, one canine, four premolars, and three or two molars: on each side of the lower jaw the same number, except that the molars are four or three. The forefeet have five toes, the hind-feet four or five; the claws are strong, blunt, and formed for digging, and are not retractile. The tail is generally long, and is curled upwards. The female has six to ten mammæ; she goes with young nine weeks as a rule. The young are born blind, their eyes opening in ten to twelve days; their growth ceases at two years of age. The dog commonly lives about ten or twelve years, at the most twenty. By English law it is prohibited to use dogs for purposes of draught.—BIBLIOGRAPHY: W. Youatt, *Training and Management of the Dog*; R. B. Lee, *A History and Description of Modern Dogs*; F. T. Barton, *Our Dogs and All about Them*; J. S. Turner and V. Nicolas, *The Kennel Encyclopædia*.

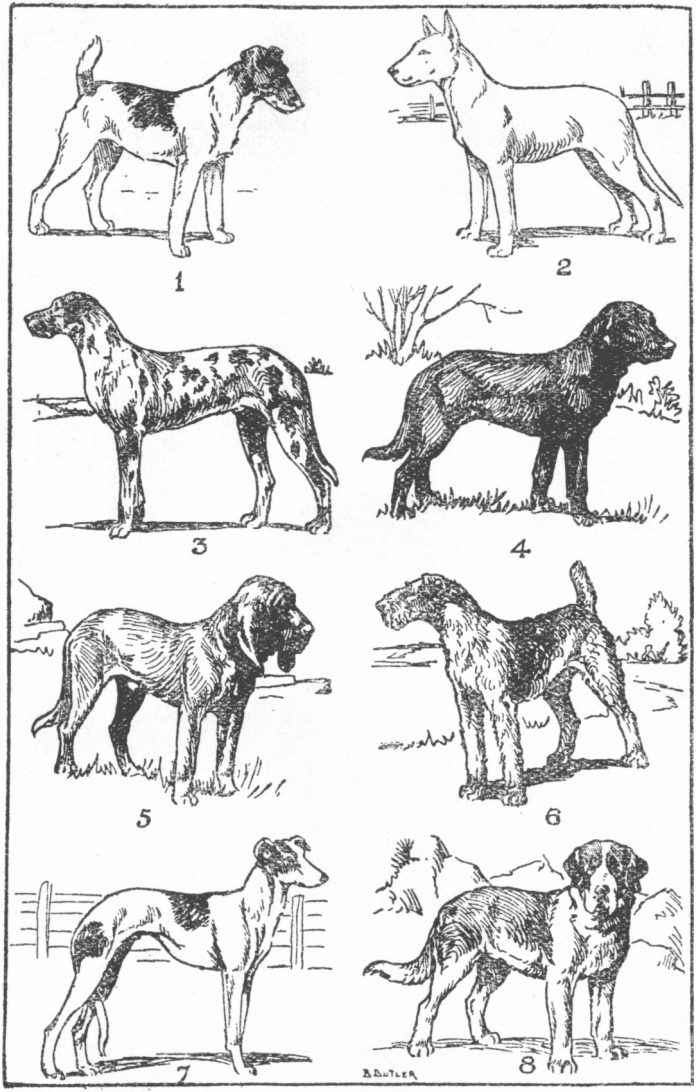
DOG-DAYS. The name applied by the ancients to a period of about forty days, the hottest season of the year, at the time of the heliacal rising of Sirius, the dog-star. The time of the rising is now, owing to the precession of the equinoxes, different from what it was to the ancients (1st July); and the dog-days are now counted from 3rd July to 11th Aug., that is, twenty days before and twenty days after the heliacal rising.

DOGE (dōj; from Lat. *dux*, a leader, later a duke). Formerly the title of the first magistrates in the Italian Republics of Venice and Genoa. The first doge of Venice elected for life was Paolo Anafesto, in 697; and in Genca, Simone Boccanera, in 1339. In 1437 the Doge of Venice obtained from the emperor a diploma creating him "Duke of Treviso, Feltre, Belluno, Padua, Brescia, Bergamo, etc." In Venice the dignity was always held for life; in Genoa, in later times, only for two years. In both cities the office was abolished by the French in 1797. The title was re-established in 1802 for the Ligurian Republic, but was abolished in 1805.

DOG-FISH. A name given to several species of small shark, common around the British Isles. The rough skin of one of the species (*Scyllium canicūla*), the lesser spotted dog-fish, is used by joiners and other artificers in polishing various substances, particularly wood. This species is rarely 3 feet long. *S. catūlus*, the greater spotted dog-fish, is in length from 3 to 5 feet. It is blackish-brown in colour, marked with numerous small dark spots. Both species are very voracious and destructive. Their flesh is hard, dry, and unpalatable. The common or picked dog-fish (*Acanthias vulgāris*) is common in British and N. American seas, and is sometimes used as food. It is fierce and voracious. *S. profundorum* has been brought up from 816 fathoms in the North Atlantic. The tiger or zebra-shark (*Stegostoma tigrinum*) is a handsome dog-fish native to the Indian Ocean. It is marked with dark stripes on a yellow ground, and may attain the length of 15 feet.

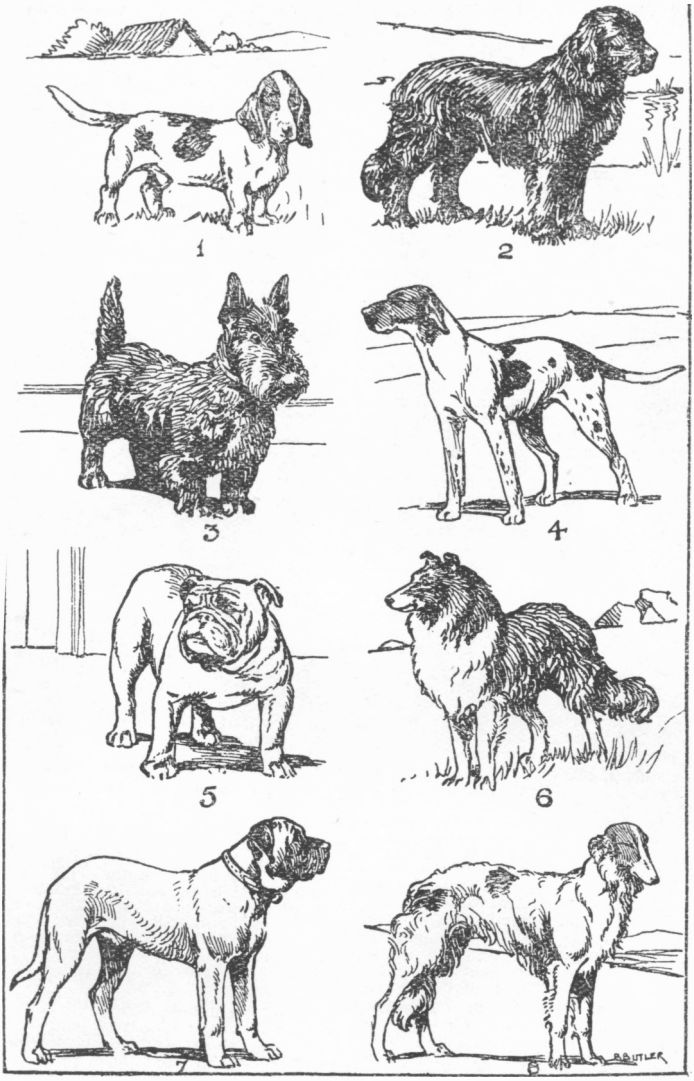
DOGGER. A Dutch vessel equipped with two masts and somewhat resembling a ketch. It is used particularly in the North Sea for the cod and herring fisheries.

DOGGER BANK. An extensive sand-bank, near the middle of the North Sea, between Denmark on the east and England on the west, celebrated for its cod-fishery. It commences about 36 miles east of Flamborough Head and extends E.N.E. to within 60 miles of Jutland, in some



DOGS

1, Fox Terrier. 2, Bull Terrier. 3, Dane. 4, Retriver. 5, Bloodhound. 6, Airedale Terrier. 7, Greyhound 8, St. Bernard.



DOGS

1, Basset Hound. 2, Newfoundland. 3, Scotch Terrier. 4, Pointer. 5, Bulldog. 6, Collie. 7, Mastiff 8, Borzoi.

places attaining a breadth of about 60 miles, though it terminates merely in a point. Where shallowest the water over it is 9 fathoms.

In Oct., 1904, the Russian Baltic Squadron fired upon a British fishing-fleet on the Dogger, killing two men. The incident was settled by arbitration. During the European War a naval battle was fought off the Dogger Bank on 24th Jan., 1915, in which three powerful German cruisers were seriously injured by a British fleet under Admiral Beatty, but made their escape to Heligoland.

DOGGETT'S COAT AND BADGE. The prize for a rowing match which is held annually on the 1st Aug., the course being on the Thames from London Bridge to Chelsea. The match is open to six young waterman whose apprenticeship ends the same year, and the prize is a waterman's red coat bearing a badge which represents the white horse of Hanover. It was instituted—in celebration of the accession of George I.—by the actor, Thomas Doggett, born in Dublin; but though first rowed in 1716, its winners have only been recorded since 1791. The match, like other events of the same kind, suspended during the War, was held again on 3rd and 4th Aug., 1920, for the years 1915 to 1920.

DOGMAT'ICS. A systematic arrangement of the articles of Christian faith (dogmas), or the branch of theology that deals with them. The first attempt to furnish a complete and coherent system of Christian dogmas was made by Origen in the third century.

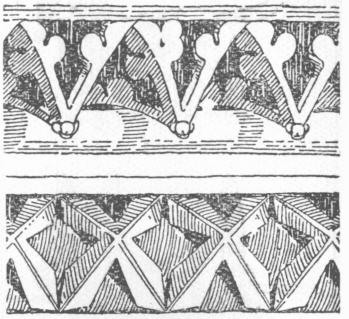
DOG-ROSE. The *Rosa canina*, or wild brier, nat. ord. Rosaceæ. It is a common British plant, growing in thickets and hedges. The fruit is known as the hip.

DOGS, Isle of. District of London. Formerly a peninsula jutting out into the Thames, opposite Greenwich, it was made into an island when the docks were built. From it there is a tunnel under the river to Greenwich. The name is said to be due to the fact that the king's kennels connected with the palace at Greenwich were here.

DOG'S-MERCURY, *Mercuriālis perennis*, nat. ord. Euphorbiaceæ. A woodland herb common in Britain. It has poisonous properties, and may be made to yield a fugitive blue dye.

DOG'S-TAIL GRASS (Cynosūrus). A genus of grasses. *Cynosūrus cristātus* is a perennial found wild all over Great Britain in pastures, lawns, and parks. Its roots are long and wiry, and, descending deep into the ground, ensure the herbage against suffering from drought. Its stem is from 1 to 2 feet high, and its leaves are slightly hairy.

DOG'S-TOOTH ORNAMENT. An architectural ornament or moulding consisting usually of four leaves



Dog's-tooth Ornaments. Early English style.

radiating from a raised point at the centre. It is the characteristic decorated moulding of Early English architecture, as the zigzag is of the Norman.

DOG-TOOTH SPAR. A form of mineral calcium carbonate or calc-spar found in Derbyshire and other parts of England, and named from a supposed resemblance of its pointed crystals to a dog's tooth.

DOG-WATCH. A nautical term distinguishing two watches of two hours each (4 to 6 p.m. and 6 to 8 p.m.). All the other watches count four hours each, and without the introduction of the dog-watches the same hours would always fall to be kept as watch by the same portion of the crew.

DOGWOOD. A common name of trees of the genus Cornus, but specifically applied in Britain to *C. sanguinea*. It is a common shrub in copses and hedges in England; the small cream-white flowers are borne in dense roundish clusters. The branchlets and leaves become red in autumn. The wood is used for skewers and for charcoal for gunpowder.

DOIT. An ancient Scottish coin, of which eight or twelve were equal to a penny sterling. In the Netherlands and Lower Germany there was a coin of similar name and value.

DOL. A town of France, department of Ille-et-Vilaine, 14 miles south-

ast by east of St. Malo. The old athedral of St. Samson mostly dates ack to the thirteenth century. To ne north of the town stretches a salt-arsh, protected from inroads of the ea by a twelfth-century dyke, and in ne centre of the marsh Mont-Dol ses to a height of 213 feet. Pop. 565.

DOLCI (dol'chē), **Carlo.** Celerated painter of the Florentine chool, was born at Florence in 1616, nd died there in 1686. His works, rincipally heads of madonnas and aints, have a character of sweetness nd melancholy. Among his chief roductions are : *Archduches Claudia*, n the Uffizi (Florence) ; *St. Cecilia at he Organ* and *Herodias with the Head f John the Baptist*, both in the Dresden Gallery ; *Ecce Homo* and *St. Andrew in Prayer*, at the Pitti Gallery ; and *Magdalene*, at Munich.

DOL'DRUMS. Among seamen, the parts of the ocean near the equator hat abound in calms, squalls, and ight baffling winds. The Horse Latitudes (*see* WIND) is a similar region.

DÔLE. A town in France, Jura, 26 miles south-east of Dijon. It is of Roman origin, was long the capital of Franche Comté, and has some interesting antiquities. The manufactures are Prussian blue, hosiery, ironware, and leather. Pop. 18,066.

DOL'ERITE. Compact rock of the Basaltic series, but crystalline throughout, composed of augite and labradorite with some titaniferous iron ore and often olivine. It makes, when unaltered, and excellent road-metal.

DOLGEL'LEY. A town of Wales, capital of Merionethshire, near the foot of Cader Idris. It was there that Owen Glendower held his Parliament in 1404 and signed his treaty with Charles VI. of France. It has manufactories of woollens, flannels, and cloths. Pop. (1931), 2261.

DOLICHOCEPHALIC (dol-i-ko-se-fal'ik). Long-headed : a term used in anthropology to denote those skulls in which the diameter from side to side is less in proportion to the longitudinal diameter (i.e. from front to back) than 8 to 10.

DOL'ICHOSAURUS ("long lizard"). An extinct snake-like reptile found in the English chalk, whose remains indicate a creature of aquatic habits from 2 to 3 feet in length.

DOLLAR. A silver or gold coin of the United States, of the value of 100 cents, or rather above 4s. sterling. The same name is also given to coins of the same general weight and value, though differing somewhat in different countries, current in Mexico, a great part of South America, Singapore, and the Philippine Islands. The name is from the Dutch (also Danish and Swedish) *daler*, from Ger. *thaler*, so named from Ger. *thal*, a dale, because first coined in Joachimsthal, in Bohemia, in 1518. By the Act of 14th March, 1900, the gold dollar was declared to be the standard of value in the United States, but no provision was made for the issue of a coin corresponding to the unit.

DOLLAR. A town and police burgh, Scotland, Clackmannanshire, 12¼ miles E. by N. of Stirling, noted for its academy, founded by John Macnab, who left £90,000 for this purpose. The building, a handsome structure in the Grecian style, was erected in 1819. The population of the burgh in 1931 was 1485.

DOLLART The. A gulf of the North Sea, at the mouth of the Ems, between the Dutch province of Groningen and Hanover. It was originally dry land, and was formed by irruptions of the sea which took place in 1277 and 1530, overwhelming thirty-four large villages and numerous hamlets.

DÖLLINGER (deul'ing-er), **Johann Joseph Ignaz.** A celebrated German theologian and leader of the Old Catholic party, was born at Bamberg, in Bavaria, in 1799, died in 1890. In 1822 he entered the Church, and soon after published *The Doctrine of the Eucharist during the First Three Centuries*, a work which won him the position of lecturer on Church history at the University of Munich. In later years he took an active part in the political struggles of the time as representative of the university in the Bavarian Parliament, and as delegate at the Diet of Frankfurt voted for the total separation of Church and State. In 1861 he delivered a course of lectures, in which he attacked the temporal power of the Papacy. But it was first at the Œcumenical Council of 1869-70 that Dr. Döllinger became famous over Europe by his opposition to the doctrine of Papal infallibility. In consequence of his opposition to the Vatican decrees, he was excommunicated in 1871 by the Archbishop of Munich.

A few months later he was elected rector of the University of Munich, where he remained until his death. When the sentence of his excommunication was pronounced, he received honorary degrees from the Universities of Oxford and Edinburgh. Among his numerous works are : *Origins of Christianity, A Sketch of*

Luther, The Papacy, Lectures on the Reunion of the Churches, and *Papal Legends of the Middle Ages*.

DOLLS. Representing more or less realistically the human form, have, for more than fifty centuries, been the common playthings of children, more

Chinese Doll

Coptic Doll

especially of girls, whose maternal instinct impels them to lavish upon these often crude surrogates all the affection and devotion which their elders display towards real babies. But in ancient times, and even in the ritual of many modern religions, worship is not infrequently paid to human images, which in ancient times and among the less cultured modern peoples, are hardly distinguishable from dolls, such as children regard as playthings and their fancy endows with a crude animism.

In the earliest times in which members of our own species, *Homo sapiens*, are known to have lived in Europe, i.e. at the latter part of the so-called Old Stone (palæolithic) Age, it was the custom to make grotesque representations of the female form as small figurines of clay or stone, which were regarded as amulets identified with the Great Mother, the giver of birth or life to mankind. As "givers of life" such amulets were believed to be able to protect their possessors against the risk of death, because they were regarded in the most literal sense of the term as life-giving. But it was not merely against the risk of death that such amulets were believed to be potent: they could add "vital substance" to the living and the dead, rejuvenating and reinvigorating the former, and enhancing the chances of continued existence and survival to the latter.

Enormous respect was naturally paid to figurines supposed to possess such far-reaching powers; and when the Great Mother came to be identified with various animals, such as the cow, pig, etc., the amulet was identified with these "givers of life" and sometimes represented in their shape. This is intimately associated with the origin of *totemism* (q.v.). It is probable that the modern doll is in part at least the survivor of these primitive images of the deities of early peoples. The fact that modern dolls are usually of the female sex may also be due to the fact of the earliest prototype of the doll being an amulet representing the Great Mother.

DOL'MAN. A long robe worn by the Turks as an upper garment. It is open in front, and has narrow sleeves. It has given its name to a kind of loose jacket worn by ladies, and to the jacket worn by hussars.

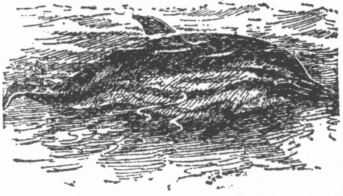
DOL'MEN. A Celtic name meaning "table-stone." Although some apply the name to prehistoric stone chambers covered with more than one slab (really "corridor tombs"), the Dolmen proper, whether round or square, has a single cover-slab, and three, four, or even more stones supporting it. Some authorities consider the name *dolmen* as simply a French equivalent for *cromlech* (q.v.).

DOL'OMITE. A mineral, the main constituent of magnesian limestone. It is composed of carbonate of calcium and carbonate of magnesium in equal molecular quantities, and varies from grey or yellowish-white to yellowish-brown. Dolomite is easily scratched with the knife, and is semi-transparent. It effervesces only slightly in *cold* hydrochloric acid. Its rhombohedral crystals are sometimes called *bitter-spar*. A variety is *pearl spar*, which has crystals with curvilinear faces and a pearly lustre.

DOLOMITES. A group of European mountains, a division of the Alps, in the Trentino, North Italy, and having the Piave and Rienz on the east, the Adige and Eisack on the west. They are named from the prevalence of the mineral dolomite, and present most interesting and picturesque scenery, the peaks being endlessly varied in form. The highest summits are Marmolata (10,972 feet); Sorapiss (10,798 feet), and Monte Tofana (10,715 feet).

DOLPHIN (*Delphīnus*). A cetaceous animal, forming the type of a family (Delphinidæ) which includes also the beluga or white whale (*Delphinapterus leucas*), the narwhal (*Monodon*), porpoises (*Phocæna*), the ca'ing whale (*Globicephalus melas*), and the killer whale or grampus (*Orca gladiator*). Dolphins inhabit every sea from the equator to the poles; they are gregarious, and swim with extraordinary velocity. The common dolphin (*D. delphis*) measures from 6 to 10 feet in length, has a long, sharp

snout with numerous nearly conical teeth in both jaws; its flesh is coarse, rank, and disagreeable, but it is used by the Laplanders as food.



Dolphin (*Delphinus*)

It lives on fish, molluscs, etc., and often may be seen in numbers round shoals of herring. The animal has to come to the surface at short intervals to breathe. The blow-hole is of a semilunar form, with a kind of valvular apparatus, and opens on the vertex, nearly over the eyes. The structure of the ear renders the sense of hearing very acute, and the animal is observed to be attracted by regular or harmonious sounds. A single young one is produced by the female, who suckles and watches it with great care and anxiety, long after it has acquired considerable size.

Dolphins are associated with many legends, and they figure in armorial bearings.—The name is also commonly but improperly given to fishes (species of Coryphæna) belonging to the mackerel family. They abound within the tropics, are about 4 or 5 feet long, very swift in swimming, and are used as food, though said sometimes to be poisonous. The corn aphis (*Siphonophora granaria*) is locally known as the dolphin.

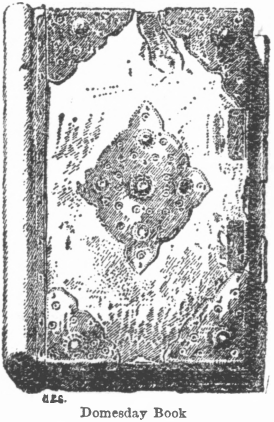
DOMAIN'. Same as **Demesne**; also applied especially to Crown lands or Government lands.—**Right of eminent domain,** the dominion of the sovereign power over all the property within the State, by which it is entitled to appropriate any part necessary to the public good, compensation being given.

DOME. A vaulted roof of spherical or other curvature, covering a building or part of it, and forming a common feature in Byzantine and also in Renaissance architecture. Cupola is also used as a synonym, or is applied to the interior, dome being applied to the exterior. (*See* CUPOLA.) Most modern domes are semi-elliptical in vertical section, and are constructed of timber; but the ancient domes were nearly hemispherical and constructed of stone. Of domes the finest, without any comparison, ancient or modern, is that of the Rotunda or Pantheon at Rome (142½ feet internal diameter and 143 feet internal height), erected in the reign of Augustus, and still perfect.

Among others the most noteworthy are St. Sophia at Istanbul (104 × 201 feet), the cathedral of Santa Maria del Fiore at Florence (139 × 310 feet), St. Peter's at Rome (139 × 330 feet), St. Paul's, London (112 × 215 feet), the Hôtel des Invalides (80 × 173 feet) and the Panthéon (formerly the church of St. Geneviève) at Paris (67 × 190 feet). The figures represent the internal diameter and height in English feet. The finest dome in America is that of the Capitol at Washington, built of cast iron.

DOMENICHINO (dō-men-i-kē'nō) (or **DOMENICO) ZAMPIERI.** A distinguished Italian painter, of the Lombard school, born at Bologna on 21st Oct., 1581. He studied under Annibal Carracci, and afterwards went to Rome, where he became painter to Pope Gregory XV. Among his best works are the *Communion of St. Jerome* in the Vatican Museum, the *History of Apollo*, the *Martyrdom of St. Agnes*, and the *Triumph of David*. He died at Naples, 15th April, 1641.

DOMESDAY (or DOOMSDAY) BOOK. A book containing a survey of all the lands in England, compiled in the reign and by the order of William the Conqueror. The survey



Domesday Book
From the original in the Public Record Office, London.

was made by commissioners, who collected the information in each district from a sworn jury consisting of sheriffs, lords of manors, presbyters, bailiffs, villeins—all the classes, in short, interested in the matter. The

extent, tenure, value, and proprietorship of the land in each district, the state of culture, and in some cases the number of tenants, villeins, serfs, etc., were the matters chiefly recorded. The survey was completed within a year. Northumberland, Durham, Cumberland, and Westmorland were not included in the survey, probably for the reason that William's authority was not then (1086) settled in those parts.

The *Domesday Book* first appeared in print in 1783 in two folios. In 1816 two supplementary volumes were published. These contained four other records of the same nature. It has been twice republished, the last time (1861-5) in perfect facsimiles of the original.—BIBLIOGRAPHY: *The Victoria County History*; F. W. Maitland, *Domesday Book and Beyond*; H. Ellis, *General Introduction to Domesday Book*; Birch, *Domesday: a Popular Account.*

DOMESTICATION. Process of accustoming animals and plants to live and propagate under human control. It comprises controlled mating, food provision, shelter, and training for specialized services. Dogs were perhaps self-domesticated before they were bred for herding and hunting in Asia and Egypt in neolithic times. Tamed horses, asses and camels were milked before man broke them in for riding and transport. Domesticated cattle, goats and other animals may have been tamed by milking them for sacrificial purposes.

DOMESTIC SCIENCE. Practice of conducting the work of the home. It includes cooking and the various cleaning processes. Of late years much attention has been paid to training in housecraft; many schools for girls have classes for the various subjects, and there are training colleges in the large towns, as well as schools for cookery. Some of them, as in Manchester, are under municipal control.

For **Teachers of Domestic Subjects,** courses are provided at King's College, London; National Training School of Cookery, Buckingham Palace Road, S.W.1; Training College of Domestic Subjects, Berridge House, Fortune Green Road, N.W.6; Battersea Polytechnic Domestic Science Training College S.W.11; and in the provinces there are several Training Colleges of Domestic Science—Gloucester, Bath, Leeds, Leicester, Liverpool, Manchester, and Newcastle-on-Tyne.

DOM'ICILE. In law, the place where a person has a home or established residence. Domicile is often an important question in determining the efficacy of legal citations, the validity of marriage, the right of succession to property, etc. For some purposes what is called a temporary domicile is sufficient, but in questions of marriage and succession it is the permanent domicile that determines the decision. A permanent domicile may be constituted by birth, by choice, or by operation of the law. To constitute a domicile by choice both actual residence and the intention to make it the permanent home are required. It is a legal principle that the wife takes the domicile of her husband. As a general rule the old domicile, and especially the domicile of origin, continues till a new one has been acquired.

DOM'INANT. In music, the fifth tone of the diatonic scale. This tone assumes the character of a key-note itself when there is a modulation into the first sharp remove. Thus G is the dominant of the scale of C, and D the dominant of the scale of G.—*Dominant chord*, in music, that which is formed by grouping three tones, rising gradually by intervals of a third from the dominant or fifth tone of the scale. It occurs almost invariably immediately before the tonic chord which closes the perfect cadence.

DOM'INIC, Saint. The founder of the order of the Dominicans, was born in 1170 at Calahorra, in Old Castile. He early distinguished himself by his zeal for the reform of canonical life and by his success as a missionary amongst the Mohammedans. His attention having been directed to the Albigenses in the south of France, he organized a mission of preachers against heresy in Languedoc. In 1215 he went to Rome to obtain the sanction of Pope Innocent III. to erect the mission into a new order of preaching friars. His request was only partially granted, and it was the succeeding Pope, Honorius III., who first recognized the importance of a preaching order, and conferred full privileges on the Dominicans.

He also appointed Dominic Master of the Sacred Palace or court preacher to the Vatican, an office which is still held by one of the order. Dominic died at Bologna in 1221, and was canonized in 1234 by Pope Gregory IX. St. Dominic is usually considered the founder of the Inquisition, which is supposed to have originated with his mission to the Albigenses; but his claim is denied, on the ground that two Cistercian monks were appointed inquisitors in 1198.—Cf. A. T. Drane, *The Life of St. Dominic.*

DOMINICA (dom-i-nē'ka). A British West India island, so named because discovered by Columbus on a Sunday (Sp. *dominica*), constituting a presidency of the united colony of the Leeward Islands between Martinique on the south, and Guadeloupe on the north. It is about 29 miles in length, north to south, and 12 miles in breadth, east to west; area, 195,200 acres, about 65,000 being under cultivation. It is rugged and mountainous, but it contains many fertile valleys and is well watered.

The shores are but little indented, and are entirely without harbours; but on the west side there are several good anchorages and bays. The principal exports consist of sugar, molasses, cocoa, and lime-juice. The imports and exports amount to about £167,799 and £68,938 annually. Dominica was ceded by France to Great Britain in 1763. Roseau is the capital. Pop. 43,098 (including about 420 aboriginal Caribs).

DOMINICAN REPUBLIC, or **SAN DOMINGO.** *See* SANTO DOMINGO.

DOMIN'ICANS. Called also *predicants*, or *preaching friars* (*prædicatores*), derived their name from their founder, St. Dominic. At their origin (1215, at Toulouse) they were governed by the rule of St. Augustine, perpetual silence, poverty, and fasting being enjoined upon them; and the principal object of their institution was to preach against heretics. Their distinctive dress consists of a white habit and scapular with a large black mantle, and hence they have been commonly known as *Black Friars*.

They were almost from the first a mendicant order. They spread rapidly not only in Europe, but in Asia, Africa, and America. In England, where they founded their first house at Oxford, there were fifty-eight Dominican houses at the dissolution of the monasteries, and the Blackfriars locality in London took its name from one of their establishments. Four Popes, Innocent V., Benedict XI., Pius V., and Benedict XIII., were Dominicans, and the order produced some famous scholars, such as Albertus Magnus and Thomas Aquinas. As fierce opponents and strenuous combatants against any departure from the teaching of the Catholic Church, the Dominicans were entrusted with the conduct of the Inquisition, and became formidable as managers of this ecclesiastical institution, which was committed exclusively to them in Spain, Portugal, and Italy.

In 1425 they obtained permission to receive donations, and ceased to belong to the mendicant orders, paying more attention to politics and theological science. With the Franciscans, their great rivals, they divided the honour of ruling in Church and State till the sixteenth century, when the Jesuits gradually superseded them in the schools and courts. They obtained new importance in 1620 by being appointed to the censorship of books for the

Dominican, or *preaching friar*

Church. Amongst notable Dominicans we may mention Savonarola, Las Casas, and Lacordaire, through whose efforts the order was revived in France in the nineteenth century. There are still establishments of the Dominicans both in England and Ireland, twenty-one houses for men and thirteen for women.—BIBLIOGRAPHY: Caro, *Saint Dominique et les Dominicains*; A. T. Drane, *The Life of St. Dominic, with a Sketch of the Dominican Order*.

DOMINION. Word denoting lordship or authority. It was chosen from Ps. lxxii. to designate Canada when its provinces were federated by the British N. America Act, 1867. The union, proclaimed July 1, is

celebrated annually as a national holiday called Dominion Day. The name, taken by New Zealand, 1907, also embraces other parts of the British Empire which have attained Dominion status. There are six of these Dominions: Canada, Australia, New Zealand, Newfoundland, the Union of South Africa and the Irish Free State. **The Dominions Office,** created in 1925, transacts business with the Dominions, previously transacted by the Colonial Office.

DOM'INO. Formerly a dress worn by priests in the winter, which, reaching no lower than the shoulders, served to protect the face and head from the weather. At present it is a masquerade dress worn by gentlemen and ladies, consisting of a long silk mantle with wide sleeves and a masquing hood. The name is also given to a half-mask formerly worn on the face by ladies when travelling or at masquerades.

DOM'INOES. A game played with small flat rectangular pieces of ivory, about twice as long as they are broad. They are marked with spots varying in number. When one player leads by laying down a domino, the next must follow by placing alongside of it another which has the same number of spots on one of its sides. Thus if the first player lays down 6-4, the second may reply with 4-8, or 6-7, etc.; in the former case he must turn in the 4, placing it beside the 4 of the first domino, so that the numbers remaining out will be 6-8; in the latter case he must turn in the 6 to the 6 in like manner, leaving 4-7, to which his opponent must now respond. The player who cannot follow suit loses his turn, and the object of the game is to get rid of all the dominoes in hand, or to hold fewer spots than your opponent when the game is exhausted by neither being able to play. The game was introduced into Europe about the middle of the eighteenth century.

DOMITIAN, or in full **TITUS FLAVIUS DOMITIANUS AUGUSTUS.** Roman emperor, son of Vespasian, and younger brother of Titus, was born A.D. 51, and in 81 succeeded to the throne. At first he ruled with a show of moderation and justice, but soon returned to the cruelty and excesses for which his youth had been notorious. He was as vain as he was cruel, and after an ineffective expedition against the Catti, carried a multitude of his slaves, dressed like Germans, in triumph to the city. He executed great numbers of the chief citizens, and assumed the titles of Lord and God. He established the most stringent laws against high treason, which enabled almost anything to be construed into this crime. At length

Domitian

a conspiracy, in which his wife Domitia took part, was formed against him, and he was assassinated in his bedroom, A.D. 96.

DOMRÉMY LA PUCELLE (doṇ-rė-mi lȧ pů-sāl). The birth-place of Joan of Arc, a small French village, department of the Vosges, 7 miles N. of Neufchâteau. The house is still shown here in which the heroine was born, and in the neighbourhood is the monument erected to her memory.

DON (ancient **TANAÏS**). A river of Russia, which issues from Lake Ivan-Ozero, in the government of Tula; and flows S.E. through the governments of Riazan Tambov, Voronej, and the Don Republic to within 37 miles of the Volga, where a railway connects the rivers. It now turns abruptly S.W. for 236 miles, and falls into the Sea of Azov; whole course nearly 1325 miles. The chief tributaries are: right bank, the Donetz and Voronezh; left, the Khoper and Manych. Although not admitting vessels of much draught, the Don carries a large traffic, especially during the spring-floods, and a canal connects it with the Volga system of navigation. It has productive fisheries. The principal port is Rostov.

DON. A river, Scotland, Aberdeenshire, rising near the Banffshire border. It flows tortuously east through the whole breadth of Aberdeenshire, and falls into the North Sea a little to the north of Aberdeen, after a total course of 82 miles. Its salmon fisheries are of considerable value.—Also, a river of Yorkshire, England, which rises near Cheshire, and joins the Ouse after a course of about 70 miles. It is

navigable for small craft as far as Sheffield.

DON (Lat. *dominus*, a lord or master). A Spanish title of honour, originally given only to the highest nobility, afterwards to all the nobles, and finally used indiscriminately as a title of courtesy. It corresponds with the Portuguese Dom. During the Spanish occupation it was introduced and became naturalized in some parts of Italy, and was particularly applied to the priests.

DON, KAYE. British racing motorist. Born in 1894, he entered the Air Force. In 1924 he made a record at Brooklands, but failed to beat Sir H. Segrave's record. In 1931 he made a world record in a motor boat of 89.9 nautical miles per hour in Miss England II. on the Parana river. Later, on Lake Garda, he established a record of 110 m.p.h. —a speed later exceed by the American, Gar Wood. On July 18, 1932, on Loch Lomond, Don broke the world's record in Lord Wakefield's Miss England III. with a speed of 119.81 m.p.h. Later in the year, however (September 4-5), Gar Wood again broke Don's record, his speed being 124.91 m.p.h.

DONAGHADEE (don-a*h*-a-dē'). A seaport and market town, Northern Ireland, County Down, on the Irish Channel, 16 miles east by north of Belfast. Pop. (1926), 2535.

DON'ALDSON, Sir James. Scottish scholar, born in 1831 at Aberdeen, died in 1915. He was educated at Aberdeen University, and also at Manchester New College, London, and Berlin University. After being rector of Stirling High School, a classical master and rector of Edinburgh High School, he was appointed in 1881 to the Chair of Humanity (Latin) in Aberdeen University. In 1886 he became principal of the United College of St. Salvator and St. Leonard in St. Andrews University, and in 1890 principal of the university.

Works. He published a *Modern Greek Grammar for the use of Classical Students* (1853); *Lyra Græca*; *Specimens of Greek Lyric Poets, with Introduction and Notes* (1854); *History of Christian Literature and Doctrine from the Death of the Apostles to the Nicene Council* (1864-6); *The Ante-Nicene Christian Library* (24 vols., 1867-72, edited jointly with Professor A. Roberts); *The Apostolical Fathers* (1874); *Lectures on the History of Education in Prussia and England* (1874); *The Westminster Confession of Faith* (1905); *Woman: her Position and Influence in Ancient Greece and Rome, and among the Early Christians* (1907); *Addresses Delivered in the University of St. Andrews from* 1886 *to* 1910 (1911). He was knighted in 1907.

DONALDSON, John William. A distinguished English philologist, was born in London in 1811, died in 1861. He studied at London University, and at Trinity College, Cambridge, where he was elected a fellow in 1835. His first work was *The Theatre of the Greeks*, a work showing much erudition. In 1839 he published *The New Cratylus*, which was amongst the earliest attempts to bring the philological literature of the Continent within the reach of the English student. In 1844 appeared the first edition of *Varronianus*, a work on Latin similar in scope to the *Cratylus*. Amongst his other writings are: *Christian Orthodoxy* (1855), *History of the Literature of Ancient Greece*, and grammars of the Hebrew, Greek, and Latin languages.

DONATELLO (properly, *Donato di Betto Bardi*). One of the revivers of the art of sculpture in Italy, was born at Florence between 1382 and 1387, died at Florence in 1466. His first great works in marble were statues of St. Peter and St. Mark, in the church of St. Michael in his native town, in an outside niche of which is also his famous statue of St. George. Along with his friend Brunelleschi he made a journey to Rome to study its art treasures. On his return he executed for his patrons, Cosmo and Lorenzo de' Medici, a marble monument to their father and mother, which is of high merit. Statues of St. John, St. George, Judith, David, John the Evangelist, and St. Cecilia are amongst his leading works.

DONA'TI'S COMET. So called from the Italian astronomer Donati, who first observed it on 2nd June, 1858. Next to the comet of 1811 it was the most brilliant that appeared last century. It was nearest the earth on the 10th Oct., 1858, and was seen until March, 1859. *See* COMETS.

DON'ATISTS. One of a body of African schismatics of the fourth century, so named from their founder Donatus, Bishop of Casæ Nigræ, in Numidia, who taught that though Christ was of the same substance with the Father yet that he was less than the Father, that the Catholic Church was not infallible, but had erred in his time and become practically extinct, and that he was to be the restorer of it. All joining the sect required to be baptized,

baptism by the impure Church being invalid.

DONA'TUS, Ælius. A Roman grammarian and commentator, born A.D. 333. He was the preceptor of St. Jerome, wrote notes on Virgil and Terence, and a grammar of the Latin language so universally used in the Middle Ages that "Donat" became a common term for grammar or primer of instruction.

DONAUWÖRTH (don'ou-*veurt*). A town of Bavaria, Germany, at the confluence of the Wornitz and Danube. It was formerly a free Imperial town, and was stormed by the Swedes under Gustavus Adolphus in the Thirty Years' War, 1632. Pop. 5000.

DON BENI'TO. A town, Spain, province of Badajoz. It has manufactures of woollens, and a trade in cattle, grain, and melons. Pop. 21,000.

DON'CASTER (*Danum* of the Romans, and *Dona Ceaster* of the Saxons). A municipal borough and market town, England, West Riding of Yorkshire, on the River Don, well built, with straight, broad streets. The parish church with its tower 170 feet high, Christ Church, the town hall, the theatre, are amongst the chief public buildings. It has railway workshops, manufactures of ropes, canvas, and machinery. It has been long celebrated for its annual races, begun in 1615, and held in September. Doncaster was originally a Roman station on the line of Watling Street. It gives its name to a parliamentary division. Pop. (1931), 63,308.

DONDRAH HEAD. The southern extremity of the Island of Ceylon. It was the site of the Sinhalese capital during part of the seventh century, numerous remains of which are still to be found.

DON'EGAL (now **TIRCONAILL**). A maritime county, Irish Free State, province of Ulster, bounded north and west by the Atlantic Ocean; area, 1,193,573 acres, of which about a fifth is under crops. The coast is indented with numerous bays; the most remarkable being Lough Swilly. It is the most mountainous county in Ireland, but has some fine fertile valleys. Mount Errigal, the loftiest summit, is about 2466 feet high. The streams and lakes are small, but numerous and abounding in fish. The climate is moist, the subsoil chiefly granite, mica-slate, and limestone, and the principal crops oats, potatoes, and flax. Agriculture generally is in a very backward state. The manufactures are limited, and consist chiefly of linen cloth, woollen stockings, and worked muslin. The fisheries are extensive and valuable, and form the chief employment of the inhabitants of the coast and islands. Grain, butter, and eggs are exported. The minerals include marble, lead, and copper, but are not, and never have been, wrought to advantage. Pop. (1926), 152,508.

DONETZ'. A Russian river which rises in the government of Kursk, flows south and east, forming the boundary of several governments, and joins the Don; length, 680 miles. Its basin is rich in coal. *See* UKRAINE.

DON'GOLA. A province of the Anglo-Egyptian Sudan, extending on both sides of the Nile from about lat. 18° to lat. 20° N. After having belonged to Egypt, the rebellion under the Mahdi caused its evacuation by the Egyptian Government, leaving it in the hands of the dervishes, but the Anglo-Egyptian forces under Lord Kitchener again occupied it in 1896. Its chief products are dates, cotton, indigo, and maize. The population is a mixture of Arabs and indigenous Nubians. Its chief town is New Dongola, or El-Ordi, on the Nile. Pop. 20,000.

DONIZET'TI, Gaetano. Italian composer, born in 1797 at Bergamo, died 8th April, 1848. He studied music at Bologna under the distinguished Abbé Mattei. His first opera, *Enrico di Borgogna*, was represented at Venice in 1818. In 1822 his *Zoraïde di Granata* gained him the honour of being crowned on the Capitol. In 1830 appeared his *Anna Bolena*, which first, along with *Lucrezia Borgia* and *Lucia di Lammermoor*—the latter his masterpiece—acquired for him a European fame. In 1835 Donizetti was appointed professor of counterpoint at the Royal College of Naples, but removed in 1840 to Paris, bringing with him three new operas, *Les Martyrs*, *La Favorita*, and *La Fille du Régiment*, of which the last two are amongst his most popular productions. Of his other operas none except *Linda di Chamounix* (1842) and *Don Pasquale* (1843) achieved any special triumph. He wrote in all as many as seventy operas.

DONJON. The principal tower of a castle, situated in the innermost court or bailey, which the garrison could make the last line of defence. Its lower part was commonly used as a prison.

DON JUAN (Sp. pron. *hu*-án'). The hero of a Spanish legend which seems to have had some historical basis in the history of a member of the noble

family of Tenorio at Seville. According to the legend, Don Juan was a libertine of the most reckless character. An attempt to seduce the daughter of the Governor of Seville brought the indignant father and the profligate don into deadly conflict, in which the former was slain. Don Juan afterwards, in a spirit of wild mockery, goes to the grave of the murdered man and invites the statue of him erected there to a revel. To the terror of Don Juan the "stony guest" actually appears at the table to bear him away to the infernal world. The legend has furnished the subject for many dramas and operas. The most famous of the latter is Mozart's *Don Giovanni*, which has made the story familiar to everybody. Amongst the former are *Burlador de Sevilla* by Tellez, *Don Juan, ou Le Festin de Pierre* by Molière (1665), and *The Libertine* by Shadwell.

The *Don Juan* of Byron bears no relation to the old story but in name and in the libertine character of the hero. Among the modern authors who have made use of the theme are: Prosper Mérimée, in *Les âmes du purgatoire*; A. Dumas, in *Don Juan de Marana*; Bernard Shaw, in *Man and Superman*; and José Zorilla, in *Don Juan Tenorio*.—Cf. Gendarme de Bévotte. *La Légende de Don Juan.*

DONKEY-ENGINE. A small engine used in various operations where no great power is required. Thus a donkey-engine is often stationed on the deck of a ship to work a crane for loading and unloading.

DONNE, John. A celebrated poet and dean of St. Paul's, was the son of a merchant of London, in which city he was born in 1573. He studied both at Oxford and Cambridge. In his nineteenth year he abjured the Catholic religion, and became secretary to the Lord Chancellor Ellesmere, but finally lost his office by a clandestine marriage with his patron's niece, a daughter of Sir George More. The young couple were in consequence reduced to great distress, till his father-in-law relented so far as to give his daughter a moderate portion.

In 1610 he wrote for the king the *Pseudo-Martyr*, and in 1612 he published a philosophical poem, *The Progress of the Soul*. By the desire of King James, Donne took orders, and, settling in London, was made preacher of Lincoln's Inn. In 1621 he was appointed Dean of St. Paul's. He was chosen prolocutor to the Convocation from 1623-4. He died in March, 1631, and was interred in St. Paul's.

As a poet, Donne stands extremely high, and may be deemed the founder of what Dr. Johnson calls the *metaphysical* class of poets. Abounding in thought, this school generally neglected versification, and that of Dr. Donne was peculiarly

John Donne

harsh and unmusical. His style is quaint and pedantic; but he displays sound learning, deep thinking, and originality of manner. A collection of his poems appeared in 1633, and they include: *The Storm, The Calm, The Blossom*, and *Upon Parting with his Mistress*. He also wrote *Letters, Sermons, Essays on Divinity*, and other pieces.—Cf. E. Gosse, *Life and Letters of John Donne.*

DONNYBROOK. Formerly a village, Ireland, now a suburb of Dublin. Its famous fair, instituted under King John in 1204, and which seldom passed off without riot and bloodshed, was abolished in 1855.

DONOGHUE, Stephen. English jockey. Born in 1894, he rode his first important winner in 1910, when he won the Cambridgeshire. Other successes followed, and after the Great War he was the leading English jockey, a position he retained for some years, riding 143 winners in 1920. On six occasions he rode the winner of the Derby. Donoghue also became known as a painter, having a picture hung in the Academy in 1925.

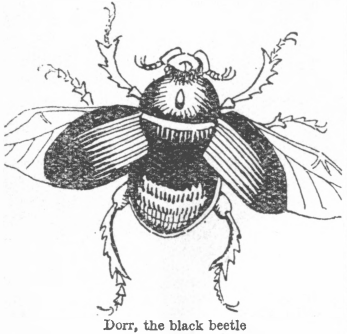
DON REPUBLIC. A republic in south-eastern Russia, formerly a government of imperial Russia, and known as the Don Cossacks' Territory. The republic was proclaimed in Jan., 1918; its capital is Novo-Tscherkask.

DOOMBOOK. A code of laws compiled by King Alfred from the West Saxon collection of his ancestor Ina, and comprising small portions of the Mercian laws of Offa, and of the Kentish collection of Ethelbert.

The code begins with the words: "The Lord spake these words to Moses, and thus said: I am the Lord thy God."—Cf. B. Thorpe, *Ancient Laws and Institutes of England*.

DOON. A river in Ayrshire, Scotland, which issues from the long, narrow Loch Doon, and falls into the Firth of Clyde; length 27 miles.

DOR, or **DORR.** The black-beetle, *Geotrupes stercorarius*, one of the most common British beetles, of a stout form, less than 1 inch long, black with metallic reflections, not



Dorr, the black beetle

to be confounded with the cockroach, commonly but erroneously called black-beetle. It may often be heard droning through the air towards the close of the summer twilight.

DORA. The name of two rivers in Northern Italy, both tributaries of the Po. The Dora Baltea rises on the southern slopes of the Mont Blanc group, and falls, after a course of about 100 miles, into the Po below Chivasso; the Dora Riparia, about 75 miles long, rises in the Cottian Alps, and joins the Po below Turin.

DOR'CHESTER. A municipal borough of England, chief town of Dorsetshire, 122¼ miles S.W. of London. There are large cavalry and infantry barracks a little to the west of the town. The trade consists chiefly in agricultural produce. Dorchester was an important Roman station (Durnovaria), and many interesting Roman remains, such as the "Maumbury Rings" (a Roman amphitheatre), are still to be found in the vicinity. It was a parliamentary borough till 1885. Pop. (1931), 10,030.

DORDOGNE (dor-dony). A department of France, which includes the greater part of the ancient province of Périgord, and small portions of Limousin, Angoumois, and Saintonge. Area, 3550 sq. miles' of which about a third is fit for the plough. The chief minerals are iron, which is abundant, slate, limestone, marble, and other stone. Mining, iron manufacture, etc., are carried on to a considerable extent, and there are a number of vineyards. The climate is mild but changeable. Pop. (1931), 383,720.—The river **Dordogne,** principal river of the department, rises on the flanks of the Puy-de-Sancy, flows W.S.W., and, after a course of 295 miles, unites with the Garonne in forming the Gironde.

DORDRECHT. *See* DORT.

DORÉ (dō-rā), **Gustave Paul.** A prolific French draughtsman and painter, born at Strasbourg, 6th Jan., 1833, died 23rd June, 1883. He studied at Paris, contributing, when only sixteen years of age, comic sketches to the *Journal pour Rire*. He distinguished himself greatly as an illustrator of books. His illustrations of Rabelais (*Rabelais Illustré*), of Perrault's *Tales*, Sue's *Wandering Jew*, Dante's *Divina Commedia*, and Cervantes' *Don Quixote* displayed great fertility of invention, and the fine fantasy of his landscapes and the dramatic effectiveness of his groups acquired for him a European reputation. His illustrations of the Bible, of Ariosto's *Orlando Furioso*, and Milton's *Paradise Lost* are also of high excellence. As a painter he has grandeur of conception and a bold expressive style. Amongst his chief works are: *Christ leaving the Prætorium*, *Paolo and Francesca di Rimini*, *The Flight into Egypt*, and *Mont Blanc*. In later years Doré also won fame as a sculptor.

DORE'MA. A genus of plants, nat. ord. Umbelliferæ. *D. ammoniacum*, a Persian species, yields the ammoniacum of commerce, a milky juice that exudes from punctures on the stem and dries in little "tears."

DORIA. One of the most powerful families of Genoa, became distinguished about the beginning of the twelfth century, and shared with three other leading families, the Fieschi, Grimaldi, and Spinola, the early government of the Republic. Amongst the older heroes of this family are Oberto Doria, who in 1284 commanded the Genoese fleet which at Meloria annihilated the power of Pisa; Lamba Doria, who in 1298 defeated the Venetian Dandolo at the naval battle of Curzola; Paganino Doria, who in the middle of the fourteenth century

distinguished himself by great victories over the Venetians.

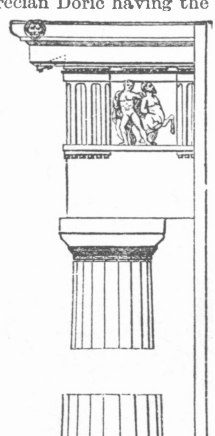
But the greatest name of the Dorias is that of Andrea, born at Oneglia in 1466, of a younger branch of the family. After serving some time as a condottiere with the princes of Southern Italy, he was entrusted by the Genoese with the reconstruction of their fleet. Disagreement with the Genoese factions drove him to take service with Francis I. of France, in which he highly distinguished himself, and in 1527 he took Genoa in the name of the French king. But being displeased with the projects of Francis for reducing Genoa to a place of secondary importance, he went over to the service of Charles V., carrying with him the whole influence and resources of Genoa, and hastened the deliverance of Italy from French domination. He entered Genoa in 1528, re-established order, reorganized the Government, and, although refusing the title of doge, practically controlled its affairs to the end of his life.

The country bestowed on him the title of *Father of Peace*. As Imperial Admiral he performed many services for Charles, clearing the seas of Moorish pirates and assisting the emperor in his expeditions to Tunis and Algiers. In 1547 his authority was threatened by the conspiracy of Fieschi, and he narrowly escaped assassination in the tumult. He died in 1560.

DORIANS. One of the three great branches of the Greek nation who migrated from Thessaly southwards, settling for a time in the mountainous district of Doris in Northern Greece and finally in Peloponnesus. Their migration to the latter was said to have taken place in 1104 B.C.; and as among their leaders were certain men reputed to be descendants of Hercules (or Herakles), it was known as the return of the Heraclidæ.

The Dorians ruled in Sparta with great renown as a strong and warlike people, though less cultivated than the other Greeks in arts and letters. Their laws were severe and rigid, as typified in the codes of the great Doric legislators Minos and Lycurgus.—The *Doric dialect* was characterized by its broadness and hardness, yet on account of its venerable and antique style was often used in solemn odes and choruses.

DORIC ORDER. In architecture, is the oldest, strongest, and simplest of the three Grecian orders, and the one that is best represented among the remains of ancient Greek architecture. The Doric column is distinguished by its want of a base (in the more ancient examples, at least), by the small number of its flutings, and by its massive proportions, the true Grecian Doric having the height



Grecian Doric Column

of its pillars six times that of the diameter. The capital was small and simple, and the architrave, frieze, and cornice were rather plain and massive.

DORIGNY (do-rē-nyē). The name of several French painters and engravers. Michael, born in 1617, became professor in the Academy at Paris, and died in 1665. Louis, son of the preceding, was born in 1654, settled in Italy, and died in 1742. Sir Nicholas, brother of Louis, born in 1658 at Paris, was the most celebrated of the three. He spent eight years in engraving the famous cartoons of Raphael at Hampton Court, and was knighted by George I. He died in 1746.

DORKING. A town of England, county of Surrey, 23½ miles S.S.W. of London, largely consisting of villa residences. Large numbers of fowls, known as *Dorkings*, of an excellent breed, having five claws on the foot, are reared here, and sent to the London markets. The breed was introduced both into Gaul and Britain when those countries were subject to the Roman power. Pop. (1931), 10,109.

DORMER WINDOWS (Fr. *dormir*, to sleep). Are windows inserted in the inclined plane of a sloping roof,

on a frame rising vertically above the rafters. They are named dormer windows because they are found chiefly in attic bedrooms.

DORMOUSE. The popular name of small rodent mammals constituting a special family (Gliridæ or Myoxidæ) allied to rats and mice. They inhabit temperate and warm countries, and subsist entirely on vegetable food. Their pace is a kind of leap, but they have not the activity of squirrels. Whilst feeding they sit upright and carry the food to their mouths with their paws. Dormice pass the winter in a lethargic or torpid state, reviving only for a short time on a warm sunny day, when they take a little of their hoarded stores and then relapse into the dormant state. The squirrel-tailed or "fat" dormouse (*Myoxus glis*) of the continent was esteemed as an article of diet by the ancient Romans. The common British dormouse (*Muscardinus avellanarius*) is a graceful little creature about 3 inches in length, with a tail 2½ inches long. It feeds on hazel-nuts, eggs, and insects, and constructs a spherical nest. It is not known to occur in Scotland or Ireland.

DORN'BIRN. A manufacturing town in Tirol, about 6 miles from the Lake of Constance. Pop. 14,390.

DORNICK. A kind of stout figured linen fabric used for table-cloths, and generally chequered. It derives its name from Doornik, or Tournai, in the Netherlands. The manufacture was brought into Norfolk by the Dutch.

DORNOCH (-no*h*). A seaport and royal burgh of Scotland, county of Sutherland, at the entrance of the Dornoch Firth, the seat of the extinct bishopric of Caithness. It was one of the Wick parliamentary burghs. Pop. (1931), 725.—The **Firth** runs inland for about 16 miles between Ross-shire and Sutherlandshire.

DOR'OHOI. A town of Rumania in N.W. Moldavia, near the Austrian frontier. Pop. 15,375.—The department of **Dorohoi** has an area of 1090 sq. miles, and a pop. of 189,789.

DOR'PAT (now **TARTU**). A town, once in the Russian province of Livonia, now belonging to the Republic of Estonia. It is situated on the Embach, about 135 miles N.E. of Riga. Dorpat is chiefly remarkable for its university and other educational establishments. It is an ancient town, and was once a member of the Hanseatic Union. Captured by the Russians in 1559, it was ceded to Poland in 1582, was subsequently taken by the Swedes, and in 1 04 passed to the Russians, who called it *Yuryev*. The town was occupied by the Germans on 18th Feb., 1918. The vernacular language is Esthonian, but the upper classes speak German. Pop. 72,000.

D'ORSAY, Alfred, Count. A dilettante artist and man of fashion, born at Paris, 1801, died 1852. When a young man he visited England, and became acquainted with Byron and other literary and fashionable celebrities. He married a daughter of the Earl of Blessington, but after the earl's death a separation took place, and D'Orsay became an inmate of Gore House, which the Countess of Blessington had made the centre of a famous literary coterie. A zealous Bonapartist, he followed Prince Louis Napoleon to Paris in 1849, and enjoyed his favour till his death. Disraeli has described him in his novel *Henrietta Temple*, under the name of "Count Mirabel."—Cf. Richard Madden, *Life of Lady Blessington*.

DORSET, EARL OF. *See* SACKVILLE.

DORSET, or **DORSETSHIRE.** A maritime county in the south of England, having on the south the English Channel; area, 622,843 acres, over 490,000 being under crop. The general surface of the county is undulating; its principal elevations being chalk hills known as the North and South Downs, upon which immense flocks of sheep are pastured. On the south, on the borders of Hampshire and along part of the sea-coast, is a heathy common. A great part of the county is in grass, and dairy husbandry is extensively carried on. Neither coal nor ores of any kind are found, but the quarries yield the well-known Portland stone. Pipe-clay, plastic clay, and potter's clay also abound. The principal manufactures are those of flax, canvas, duck, etc., also silk and woollens. The fish frequenting the coast are of various kinds, but mackerel is the most abundant. Near the mouth of Poole harbour is a prolific oyster bank. The principal rivers are the Stour, the Frome, and the Piddle. The county has four parliamentary dvisions, with a member for each. Dorchester is the county town. Other towns are Bridport, Poole, and Weymouth. Pop. (1931), 239,347.

DORSETSHIRE REGIMENT, The. Once known as the East Middlesex, dates from 1702, and is intimately associated with Gibraltar, which it twice defended during siege (1727

and 1779-82). For its services in India under Clive it bears the motto *Primus in Indis*. It later took part in the relief of Ladysmith, and during the European War suffered heavily on the Western front, being also represented at Kut and Ramadie.

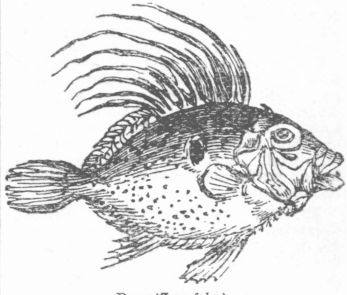
DORSTE'NIA. A genus of plants, nat. ord. Moraceæ, found in tropical America. They have their naked flowers buried in a flat, fleshy somewhat concave receptacle. *D. Contrayerva* and other species have a stimulant and tonic rhizome, which is used medicinally under the name of *contrayerva*.

DORT, or DORDRECHT. A town, Holland, province of South Holland, 12¼ miles S.E. of Rotterdam, on the Merwede, an arm or part of the Maas, and on an island separated from the mainland by an inundation in 1421. It is an old town, founded in 1018 by Count Dietrich III. of Holland, with a fine Gothic Church (Groote Kerk, "Great Church"), a good town-house and museum. It was formerly of more importance than now, but it still carries on an extensive trade, being not only near the sea, but by the Rhine, the Maas, and other water communications, connected with an immense extent of inland territory. Pop. 55,888.

DORT, Synod of. An assembly of Protestant divines convoked at Dort on 13th Nov., 1618, dissolved on 9th May, 1619. Besides the Dutch and Walloon divines, it included representatives from England, Scotland, Switzerland, and part of Germany, in all about sixty-two native and twenty-four foreign deputies. The Synod was convoked principally for the sake of crushing the Arminian party, and extreme measures were taken to prevent that party being represented in the assembly or having a free voice there. The result was the condemnation of the Arminians and the dogmatic establishment of Calvinism in the Reformed Church. The Synod also set on foot the Dutch translation of the Bible known as the Dort Bible.

DORT'MUND. A city of Germany, province of Westphalia, on the Emscher, 47 miles N.N.E. of Cologne, starting-point of an important canal to the lower Ems. It has rapidly increased in recent years, being the centre of important railway systems, having extensive coal-mines in the vicinity, and active manufactures of iron, steel, machinery, and railway plant. There are also a number of breweries, potteries, tobacco factories, and chemical works. It was once a free Imperial Hanseatic town, and the seat of the chief tribunal of the Vehme. Pop. 525,837.

DORY, or JOHN DORY (*Zeus faber*). A bony fish which is the type of a special family (Zeidæ), and is celebrated for the delicacy of its flesh. It seldom exceeds 18 inches in length, and is yellowish-green in colour with a blackish spot on each side, which, according to an



Dory (*Zeus faber*)

old superstition, is the mark of St. Peter's forefinger and thumb; another claimant for this honour is the haddock. The dory is found on the Atlantic shores of Europe and in the Mediterranean. The name John Dory is supposed to be derived from the Fr. *jaune dorée*, golden yellow.

DOSSO DOSSI, Giovanni di Lutero. Italian painter of the Ferrara school; born 1479, died 1542. He was much honoured by Duke Alfonso of Ferrara, and immortalized by Ariosto (whose portrait he executed in a masterly manner) in his *Orlando*. Modena, Ferrara, and Dresden possess most of his works. *Circe in the Woods* is in the Borghese Gallery, and *St. Sebastian* in the Brera at Milan.

DOSTOIEV'SKY, Feodor Mikhailovitsh. A famous Russian novelist, born 1821, died 1881. After serving as an officer of engineers he devoted himself to literature, but becoming connected with the communistic schemes of Petrashevsky, he was condemned to death. At the last moment, when Dostoievsky was already on the scaffold, the sentence was commuted, and he was banished to the mines of Siberia. Pardoned by Alexander II., he returned in 1856 to resume his literary activity. His first novel, *Poor People*, came out in 1846. Among his works that have appeared in English are: *Crime and Punishment*; *Injury and Insult*; *The Friend of the Family*; *The Gambler*; *The Idiot*; *Prison*

Life in Siberia; *Uncle's Dream*; *The Permanent Husband*; *The Brothers Karamzov*; *Letters from the Underworld and Other Tales*. There is a complete edition of his novels by C. Garnett, 1912.—BIBLIOGRAPHY: J. A. T. Lloyd, *A Great Russian Realist*; J. M. Murry, *F. Dostoievsky: a Critical Study*.

DOTTEREL (*Eudromias morinellus*). A species of plover which breeds in the north of Europe, and returns to the south for the winter. In Scotland it appears in April and leaves in August, the young being hatched in July, but comparatively few breed in the British Islands. It is found all over Europe and Northern Asia. The dotterel is about 8 inches long. Contrary to the general rule the hen is larger and more brightly coloured than the cock, and the latter performs most of the duties of incubation.

DOUAI (dö-ā). Town, France, department of Nord, on the Scarpe, 18 miles south of Lille. It is one of the oldest towns in France, of which it became part by the Treaty of Utrecht. It is strongly fortified, has a fine town-house, several handsome churches, an academy of arts and law, a lyceum, museum and public library, Benedictine college, and hospital; a cannon foundry, linen manufactories, machine-works, and tanneries. There was long here a college for British Roman Catholic priests, the most celebrated of its kind, founded by Cardinal Allen in 1568. Douai was captured by the Germans during the European War, and retaken by the Allies in Oct., 1918. It received the Cross of the Legion of Honour in Sept., 1919. Pop. 41,598.

DOUAI BIBLE. The English translation of the Bible used among English-speaking Roman Catholics, and executed by divines connected with the English College at Douai. The New Testament was published in 1582 at Rheims, the Old during 1609-10 at Douai, the translation being based on the *Vulgate*. Various revisions have since materially altered it.

DOUARNENEZ (dụ-ar-nė-nā). A seaport, France, Finistère, on a beautiful bay of the same name, 13 miles north-west of Quimper. It depends chiefly on the sardine fishery. Pop. 13,753.

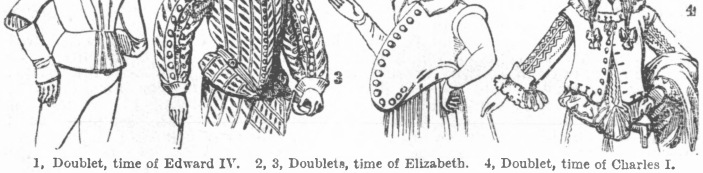
DOUBLE FERTILIZATION. *See* EMBRYO-SAC.

DOUBLE-FLOWERING. The development, often by cultivation, of the stamens and pistils of flowers into petals, by which the beauty of the flower is enhanced and its reproductive powers sacrificed. ,

DOUBLE-INSURANCE. The effecting of two insurances upon the same goods. In marine insurance it is lawful for a shipper to insure his goods twice, but only to give an additional security in the event of the failure of the first underwriters. In the event of a loss it is ultimately divided among the underwriters in the ratio of the risks they have taken.

DOUBLE-STARS, or BINARY STARS. Stars which are so close together that they appear as one to the naked eye, but are seen to be double when viewed through a telescope. One of these stars may revolve about the other, or, more accurately speaking, both revolve round the common centre of gravity.

DOUBLET. A close-fitting garment, covering the body from the neck to a little below the waist. It was introduced from France into England in the fourteenth century, and was worn by both sexes and all ranks until the time of Charles II., when it was superseded, as far as men were concerned, by the coat and waistcoat. The garment got its name from being originally lined or wadded for defence.



1, Doublet, time of Edward IV. 2, 3, Doublets, time of Elizabeth. 4, Doublet, time of Charles I.

DOUBLET. In lapidary work, a counterfeit stone composed of two pieces of crystal, with a colour between them, so that they have the same appearance as if the whole substance of the crystal were coloured.

DOUBLOON'. A gold coin of Spain and of the Spanish American States, originally double the value of the pistole. The doubloon of Spain was subsequently equivalent to about a guinea sterling. The doubloon of Chile was worth about 18*s.* 9*d.* sterling; that of Mexico, £3, 4*s.* 8*d.*

DOUBS (dŏ). A department of France, having Switzerland on its eastern frontier. Its surface is traversed by four chains of the Jura. The temperature is variable, and the climate somewhat rigorous. About a third of the land is arable, but much the greater part is covered with forests. Maize, potatoes, hemp, flax are the principal crops. Much dairy produce is made into Gruyère cheese. The minerals include iron, lead, and marble. Area, 2052 sq. miles; pop. (1931), 305,500.—The River Doubs rises in the department to which it gives its name, flows first north-east, then north-west till it joins the Saône at Verdun-sur-Saône; length, 269 miles.

DOUCHE (dösh). A jet or current of water or vapour directed upon some part of the body; employed in bathing establishments. When water is applied, it is called the *liquid douche*, and when a current of vapour, the *vapour douche*.

DOUGLAS (dug'las). A family distinguished in the annals of Scotland. Their origin is unknown. They were already territorial magnates at the time when Bruce and Baliol were competitors for the crown. As their estates lay on the borders they early became guardians of the kingdom against the encroachments of the English, and acquired in this way power, habits, and experience which frequently made them formidable to the Crown. We notice in chronological succession the most distinguished members of the family. **James,** son of the William Douglas who had been a companion of Wallace, and is commonly known as the Good Sir James, early joined Bruce, and was one of his chief supporters throughout his career, and one of the most distinguished leaders at the battle of Bannockburn. He was called "Black Douglas" from his swarthy complexion. He fell in battle with the Moors while on his way to the Holy Land with the heart of his master, in 1331.

Archibald, youngest brother of Sir James, succeeded to the regency of Scotland in the infancy of David. He was defeated and killed at Halidon Hill by Edward III. in 1333. —**Wi liam,** son of the preceding, was created first earl in 1357. He recovered Douglasdale from the English, and was frequently engaged in wars with them. He fought at the battle of Poitiers and died in 1384.—**James,** the second earl, who, like his ancestors, was constantly engaged in border warfare, was killed at the battle of Otterburn in 1388. After his death the earldom passed to an illegitimate son of the Good Sir James, Archibald the Grim, Lord of Galloway.—**Archibald,** son of Archibald the Grim and fourth earl, was the Douglas who was defeated and taken prisoner by Percy (Hotspur) at Homildon, 14th Sept., 1402. He was also taken prisoner at Shrewsbury, 23rd July, 1403, and did not recover his liberty till 1407. He was killed at the battle of Verneuil, in Normandy, in 1427. Charles VII. created him Duke of Touraine, which title descended to his successors. He was surnamed "The Tyneman," or loser, on account of his many misfortunes in battle.

William, sixth earl, born 1422, together with his only brother David was assassinated by Crichton and Livingstone at a banquet to which he had been invited in the name of the king, in Edinburgh Castle, on 24th Nov., 1440. Jealousy of the great power which the Douglases had acquired from their possessions in Scotland and France was the cause of this deed.—**William,** the eighth earl, a descendant of the third earl, restored the power of the Douglases by a marriage with his cousin, heiress of another branch of the family; was appointed Lord-Lieutentant of the kingdom, and defeated the English at Sark. Having entered into treasonous league, he was invited by James II. to Stirling and there murdered by the king's own hand, 22nd Feb., 1452.

James, the ninth and last earl, brother of the preceding, took up arms with his allies to avenge his death, but was finally driven to England, where he continued an exile for nearly thirty years. He entered Scotland on a raid in 1484, but was taken prisoner and confined in the abbey of Lindores, where he died in 1488. His estates, which had been forfeited in 1455, were bestowed on the fourth Earl of Angus, the "Red Douglas," the representative of a younger branch of the Douglas family, which continued long after to flourish. The fifth Earl of Angus,

Archibald Douglas, was the celebrated "Bell-the-Cat," one of whose sons was Gawin Douglas the poet. He died in a monastery in 1514. Archibald, the sixth earl, married Queen Margaret, widow of James IV., attained the dignity of regent of the kingdom, and after various vicissitudes of fortune, having at one time been attainted and forced to flee from the kingdom, died about 1560. He left no son, and the title of Earl of Angus passed to his nephew David.

James Douglas, brother of David, married the heiress of the Earl of Morton, which title he received on the death of his father-in-law. His nephew, Archibald, eighth Earl of Angus and Earl of Morton, died childless, and the earldom of Angus then passed to Sir William Douglas of Glenbervie, his cousin, whose son William was raised to the rank of Marquess of Douglas. Archibald, the great-grandson of William, was raised in 1703 to the dignity of Duke of Douglas, but died unmarried in 1761, when the ducal title became extinct, and the marquessate passed to the Duke of Hamilton, the descendant of a younger son of the first marquess.

The line of Angus or the Red Douglas is now represented by the Houses of Hamilton and Home, who both claim the title of Earl of Angus.—BIBLIOGRAPHY: David Hume of Godscroft, *A History of the House of Douglas and Angus*; Sir H. Maxwell, *A History of the House of Douglas*.

DOUGLAS, Gawin. An early Scottish poet of eminence. He was the son of Archibald, fifth Earl of Angus, and was born at Brechin about 1474. He received a liberal education, commenced at home and completed at the University of Paris. On returning to Scotland he took orders in the Church, and ultimately became Bishop of Dunkeld, through the influence of his nephew, the sixth Earl of Angus, who married Queen Margaret, widow of James IV. He died of the plague in 1522 in London, where he had been obliged to take refuge on account of political commotions.

He translated Virgil's *Æneid* into verse with much spirit and elegance, prefixing original prologues to the different books of the original. This was the first poetical translation into English of any classical author. It was written about 1512, and first published in 1553. He also wrote *The Palace of Honour* and *King Hart*, both allegorical poems.—Cf. J. H. Millar, *Literary History of Scotland*.

DOUGLAS, Sir Howard, Baronet, G.C.B. A British general, born in 1776, the son of Admiral Sir Charles Douglas. He served in Spain in the Peninsular War, and acquired much reputation by his writings on military subjects, especially by his *Military Bridges and the Passage of Rivers* (1816), and *Treatise on Naval Gunnery* (1819). From 1823 to 1829 he was Governor of New Brunswick, and from 1835 to 1840 Lord High Commissioner of the Ionian Islands. He attained the rank of general in 1851, and died in Nov., 1861.

DOUGLAS, Stephen Arnold. American politician, born in Vermont, 1813, died 1861. Having gone to Jacksonville, Illinois, he became an attorney, was appointed Attorney-General for the State, and in 1843 was elected a member of the United States House of Representatives. In 1847 he was elected to the Senate, and by re-election was a member of this body till his death. He was especially prominent in connection with the question as to the extension of slavery into new states and territories, which he maintained was a matter to be settled by the people of the respective states or territories, and not by Congress. He was a presidential candidate in 1860, when Lincoln was elected.

DOUGLAS, Sir William Fettes. Painter, born in Edinburgh, 1822, died in 1891. He was educated at the High School in that city, spent ten years in a bank before finally deciding (in 1847) upon the artist's profession. In 1851 he was elected an Associate of the Royal Scottish Academy, and three years later a full member. In 1877 he became Curator of the National Gallery of Scotland, resigning the post in 1882 on his election as president of the Royal Scottish Academy.

Among the finest of his early pictures are: *Bibliomania* (1852, in the National Gallery), *The Ruby Ring* (1853), *The Alchemist* (1855), *Hudibras and Ralph visiting the Astrologer* (1856), and *The Rosicrucian* (1856), many of these showing much of the Pre-Raphaelite spirit, with abundance of detail. After 1870 he devoted himself rather to landscape, and his *Stonehaven Harbour* and *A Fishing Village* (1874-5) are perhaps his masterpieces. He was knighted in 1882.

DOUGLAS (dug'las). Capital of the Isle of Man, is situated on the south-east coast, on a beautiful semicircular bay. It is frequented by immense numbers of visitors during the summer. Among the objects of interest are the House of Keys, the

custom-house, the extensive breakwater, and the promenade. Pop. (1931), 19,329.

DOULTON (dōl'tun), **Sir Henry.** "The greatest potter of the nineteenth century," born in Lambeth in 1820, died in 1897. On leaving University College School, in 1835, he joined his father, who had carried on a small pottery since 1815, and began by perfecting himself in all the mechanical processes then used by potters. He scored his first distinct success in 1846 with glazed drain-pipes, and in 1851 and 1862 the firm obtained medals for stoneware vessels and chemical apparatus.

At the South Kensington Exhibition in 1871 a striking display was made of the new Doulton artistic ware. Doulton exhibited at Vienna in 1873, and at Paris five years later, when he was made a chevalier of the Legion of Honour. He then established a school of artists in connection with his manufactory, with the object of promoting originality in design. He received the Albert gold medal of the Society of Arts in 1885, and was knighted at the Jubilee two years later.

DOUMER, Paul. French politician. Born at Aurillac, March 22, 1857, he became a journalist. In 1888 he was elected to the Chamber of Deputies. In 1895-96 he was Minister of Finance, and from 1897 to 1902 was Governor-General of Indo-China. In 1905-06 he was President of the Chamber of Deputies, and in 1912 he was elected to the Senate. In 1917 he was a member of the Painlevé Cabinet and in 1921-22, and again in 1925-26, he was finance minister. In 1927 Doumer was chosen president of the Senate, and in May, 1931, was elected President of the Republic, defeating M. Briand. In May, 1932, he was shot by a foreigner when at a crowded social function, and died a few hours later.

DOUMERGUE, Gaston. French statesman. Born Aug. 1, 1863, he became a lawyer and entered the public service. Having served abroad he was elected to the Chamber of Deputies in 1893. From 1902-05 he was Minister for the Colonies; from 1906-08 Minister of Commerce, and from 1908-10 Minister of Education. In 1910 he entered the Senate and in 1913-14 was for a short time Prime Minister and Minister for Foreign Affairs; from 1914-17 he was Minister for the Colonies. In 1923 Doumergue became President of the Senate, and in 1924 he was elected President of the Republic, the first Protestant to hold that position. His term ended in 1931.

DOUM PALM (dōm). A palm tree, *Hyphæne thebaica.* It is remarkable, like the other species of the genus, for having a repeatedly branched stem. Each branch terminates in a tuft of large fan-shaped leaves. The fruit is about the size of an apple;

Doum Palm

it has a fibrous mealy rind, which tastes like gingerbread (whence the name *ginger-bread tree* sometimes applied to this palm), and is eaten by the poorer inhabitants of Upper Egypt, where it grows. An infusion of the rind is also used as a cooling beverage in fevers. The seed is horny, and is made into small ornaments. Ropes are made of the fibres of the leaf-stalks.

DOUNE (dön). A burgh in W. Perthshire, Scotland, on the River Teith, 9 miles north-west of Stirling, once famous for its manufacture of Highland pistols and sporrans. The old ruined castle—an imposing structure now partially repaired—is described in Scott's *Waverley.* Pop. (1931), 822.

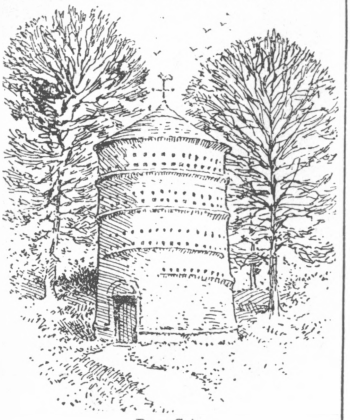
DOURO (dō'rō). One of the largest rivers of the Spanish Peninsula, which, flowing west, traverses about one-half of Spain and the whole of Portugal, and, after a course of 485 miles, falls into the Atlantic 3 miles below Oporto. It is navigable for small vessels for about 70 miles.

DOVE. *See* TURTLE-DOVE and PIGEON.

DOVE (dōv). A river, England, Derbyshire, which, after a course of

39 miles through highly picturesque scenery, falls into the Trent.

DOVE-COTES. Pigeon-keeping to provide a food-supply is a practice



Dove-Cote

of considerable antiquity, and dove-cotes are found in many quarters of the world. Those introduced into Britain by the Normans were modelled on the Roman *columbarium*, a massive circular structure, lined with nest-holes, and having a domed roof. A fine example of this type, built 1326, survives at Garway, Herefordshire. Till towards the end of the sixteenth century, these buildings, numbering some 26,000 formed items of manorial privilege in England, and were long confined to Scottish baronies. About this period square and octagonal forms became common, a fine brick specimen of the latter style remaining at Whitehall, Shrewsbury.

In Scotland typical "doo'-cots" exist in the Edinburgh suburbs of Liberton and Corstorphine. That at Liberton, a type common in Scotland but rare in England, is oblong, with lean-to roof and two compartments—probably to avoid disturbing the whole flock when "squabs" were taken from the nests. Dove-cotes fell generally into disuse when the introduction of "roots" insured the winter feeding of farm-stock and a consequent steady supply of fresh meat; but their antiquarian interest and frequent beauty call for the careful preservation of existing specimens.

DO'VER. A municipal borough of England, county of Kent, 70 miles south-east of London. It lies on the coast of the Straits of Dover, and is 21 miles distant from Calais on the French coast. It is an important railway terminus, and as a port for mail and packet service with the Continent has a large passenger traffic. Ship-building, sail-making, and fisheries are carried on. There are two docks and a tidal harbour; an outer harbour of 70 acres, enclosed by a new pier and the extended Admiralty Pier, completed in 1871.

Very extensive harbour improvements, begun in 1893, were carried out in subsequent years. The celebrated castle stands on a high chalk cliff. Dover is the chief of the Cinque Ports, and has extensive barracks. A parliamentary borough till 1918, Dover now gives its name to a parliamentary division of Kent. Dover was frequently raided by German aviators during the European War. Pop. (1931), 41,095.

DOVER. A city of the United States, in New Hampshire. It is situated on both sides of the Cochecho, which has here a fall of over 30 feet, affording abundant water-power for the large iron and cotton manufactories. Pop. 13,573.

DOVER, Straits of. The narrow channel between Dover and Calais which separates Great Britain from the French coast. At the narrowest part it is only 21 miles wide. The depth of the channel at a medium in the highest spring-tides is about 25 fathoms. On both the French and English sides the chalky cliffs show a correspondency of strata which leaves no room for doubt that they were once united, a fact which is clearly shown by many other proofs.

DOVRE-FJELD (dō-vre-fyel). An assemblage of mountain masses in Norway, forming the central part of the Scandinavian system, and extending as a plateau 2000 feet high E.N.E. from lat. 62° N. to lat. 63°. It is generally composed of gneiss and mica schist. One of the mountains belonging to it is Snehaetta, 7620 feet.

DOW, Gerard. An eminent painter of the Dutch school, was the son of a glazier, and born at Leyden in 1613. He studied under Rembrandt, and united his master's manner in chiaroscuro with the most minute finish and delicacy. Among his pictures, generally of small size and mostly scenes of family life, are: *The Evening School*, *Young Mother*, *Woman Sick with Dropsy*, and *The Bible Reader*. Dow died in 1675.

DOWDEN, Edward. English critic, historian, and educator, was born at Cork in 1843, died in 1913. He studied at Queen's College, Cork, and

Trinity College, Dublin, where he gained great distinction, especially in English and Philosophy; and in 1867 he was elected to the professorship of English literature in the university. He was the first Taylorian lecturer at Oxford University in 1889, and held the Clark lectureship in English literature at Trinity College, Cambridge, from 1893 to 1896. Besides contributing to periodicals, Professor Dowden published various works on literary subjects, in particular: *Shakspere: his Mind and Art* (1875); *Shakspere Primer*; *Studies in Literature*; *Southey*; *Southey's Correspondence with Caroline Bowles*; *Life of Shelley* (2 vols., 1886), the chief authority on the poet's life, being founded on papers in the possession of the Shelley family; *Wordsworth's Poetical Works* (1892-3); *Introduction to Shakspere* (1893); *New Studies in Literature* (1895); *The French Revolution and English Literature* (lectures delivered at Princeton College, New Jersey, in 1896); *History of French Literature* (1897); *Robert Browning* (1904); *Michel de Montaigne* (1905); *Essays, Modern and Elizabethan* (1910). A volume of poems by him appeared in 1876, and his collected *Poetical Works* and *Letters* appeared in 1914.

DOWER (Fr. *douaire*, Lat., *dos*, dower). In English law, is the right which a wife (not being an alien) has in the freehold lands and tenements of which her husband dies possessed and undisposed of by will. By common law this right amounts to one-third of his estate during her life; by local custom it is frequently greater. Where the custom of *gavelkind* prevails, the widow's share is a half, and that of *free-bench* gives her the whole or a portion of a copyhold, according to the custom of the manor. The term is also applied to the property which a woman brings to her husband in marriage, but this is more correctly *dowry*.

DOWLAIS. A town of South Wales, Glamorganshire, included in the parliamentary borough of Merthyr Tydfil, from which it is distant 1½ miles north-east, with important iron and steel works.

DOWLAS. A kind of coarse linen formerly much used by working people for shirts; this use of it is now generally superseded by calico. —Cf. Shakespeare, *1st Henry IV.*, iii, 3.

DOWLETABAD. *See* DAULATABAD.

DOWN. A county of Northern Ireland, in Ulster, bounded N. by Belfast Lough and E. by the Irish Sea; area, 608,861 acres, of which over five-sixths are productive. Down is copiously watered by the Rivers Bann, Lagan, and Newry, and has numerous small lakes. The surface is very irregular, and in parts mountainous, Slieve Donard, in the Mourne Mountains, being 2796 feet high. Agriculture is in a flourishing condition, oats, wheat, flax, turnips, and potatoes being the principal crops. The native breed of sheep is small, but valued for the delicacy of its mutton and the fine texture of its wool. The principal manufactures are linen and muslin. The fisheries on the coast, principally cod, haddock, and herring, are considerable. The county has five parliamentary divisions, each returning a member. The county town is Downpatrick; others are Newry, Newtonards, Bangor, and Banbridge. Pop. (1926), 209,228.

DOWNING COLLEGE. One of the colleges of the University of Cambridge, chartered in 1800 and opened in 1821. Its founder was Sir George Downing, a Cambridgeshire gentleman.

DOWNING STREET. A street in London, leading from Whitehall. The name is used as a synonym for the British Government, the Foreign Office and Colonial Office being located in it. No. 10 is the official residence of the Prime Minister, and No. 11 that of the Chancellor of the Exchequer.

DOWNPATRICK. A market town of Northern Ireland, county town of Down, 21 miles S.E. of Belfast. It is the seat of the diocese of Down, Connor, and Dromore, has a cathedral, and is celebrated as the supposed burial-place of St. Patrick. Pop. (1926), 3147.

DOWNS. A term given to undulating grassy hills or uplands, specially applied to two ranges of undulating chalk hills in England, extending through Surrey, Kent, and Hampshire, known as the North and South Downs. The word is sometimes used as equivalent to *dunes* or sandhills.

DOWNS, The. A celebrated roadstead for ships, extending 6 miles along the east coast of Kent in England, protected on the seaward side by the Goodwin Sands.

DOWNTON. A town of England, in Wilts., on the Avon, 6 miles S.S.E. of Salisbury; an ancient place, with a large cruciform church in the Norman and later styles, an old earthwork mound called "the Moat," and an agricultural college. Pop. 1906.

DOXOL'OGY (from Gr. *doxa*, praise, glory, and *logos*). A set form of words giving glory to God, and especially a name given to two short hymns distinguished by the title of *greater* (Glory be to God on high, etc.) and *lesser* (Glory be to the Father, etc.). Both the doxologies have a place in the Church of England liturgy, the latter being repeated after every psalm, and the former used in the communion service.

DOYEN, Eugène Louis. Famous French surgeon, born at Rheims in 1859, died at Paris in 1916. He made numerous discoveries in gynæcological surgery, and in 1895 established a private clinic, where many French and foreign surgeons came to study under him. His surgical methods were adopted, although his claim to have discovered the germ of cancer has been disputed. In 1898 he received the degree of LL.D. from the University of Edinburgh, where he introduced the method of teaching surgery by means of the cinematograph. His works include: *La maladie et le médecin* and *Le Cancer*.

DOYLE, Sir Arthur Conan. English novelist, a nephew of Richard Doyle, born at Edinburgh, 1859, studied medicine, and for some years practised, but gave up the profession for that of literature. In 1887 he produced *A Study in Scarlet*, in which he created the detective Sherlock Holmes. Among his other books are: *Micah Clarke*, *The Sign of Four*, *The White Company*, *The Adventures of Sherlock Holmes*, *Brigadier Gerard*, *The Great Boer War*, *The Crime of the Congo*, *The Lost World*, *The Poison Belt*, *The British Campaign in France and Flanders*, *The New Revelation*, *The Vital Message*, and *The Land of Mist*. He took a very keen interest in spiritualism. He died on 7th July, 1930.

DOYLE, Sir Francis Hastings Charles. English poet, born 21st Aug., 1810, died 8th June, 1888, was the son of Major-General Sir Francis Hastings Doyle, first baronet, succeeding his father in the title in 1839. Educated at Eton and Oxford, he graduated with first-class honours in classics in 1832, and held a fellowship at All Souls' from 1835 to 1844. After some years' work as a barrister, he became Receiver-General, and in 1869 Commissioner of Customs, having two years previously been elected professor of poetry at Oxford in succession to Matthew Arnold, a position to which he was re-elected for a second term five years later. He had already published *Miscellaneous Verses* (1840); *The Two Destinies* (1844); *The Return of the Guards and other Poems* (1866); and subsequently printed his *Oxford Lectures* (1869 and 1877) and *Reminiscences and Opinions*, 1813-85 (1886).

DOZY (dō'zi), **Reinhart.** Dutch Orientalist and historian, born 1820, died 1883. He was thoroughly versed in most of the Semitic tongues, and spoke and wrote almost all the European languages with facility. Among his works (sometimes in Dutch, sometimes in French) are: *Histoire des Musulmans d'Espagne de* 711-1110, *Géographie d'Edrisi*, *De Israelieten te Mekka*, *Het Islamisme*, *Supplements aux Dictionnaires Arabes*.

DRA'A, or WADY DRA'A. A river, or rather water-course, of Morocco, rising in the Atlas Mountains and flowing generally south-east, until, after penetrating the Anti-Atlas range and passing several oases, it suddenly turns westwards, and forms the shallow lagoon El Debaia. From this point until it enters the ocean it is a wady, and forms the southern boundary of Morocco.

DRACÆ'NA. A genus of endogenous evergreen plants, nat. ord. Liliaceæ. It includes the dragon tree of Teneriffe (*D. Draco*), celebrated for producing the resin called dragon's blood. Several species of Dracæna are cultivated in greenhouses for the beauty of their foliage, but many of the fine plants known by this name belong strictly to other genera.

DRACHENFELS (drä'hen-fels; "dragon rock"). "The castled crag of Drachenfels," as Byron calls it, a hill in Rhenish Prussia, about 8 miles south-east of Bonn, rising 900 feet above the Rhine, and crowned by the old castle of Drachenfels.

DRACHMA (drak'ma). The unit of weight and of money among the ancient Greeks. It was the principal Greek coin, was made of silver, and was worth (the Attic drachma) about 9½d. As a weight amongst the Greeks it was about 2 dwt. 7 grains troy. The monetary unit of modern Greece is also called a drachma. Since 1867 its value has been equivalent to that of the franc of the Latin Monetary Union. It is divided into 100 *lepta*.

DRACO. A legislator of Athens, about 620 B.C., whose name has become proverbial as an inexorable and bloodthirsty lawgiver, and whose laws were said to have been written

in blood, not ink. Suidas says that he met his death at Ægina, being unintentionally suffocated by the caps and cloaks thrown at him by some of his enthusiastic supporters.

DRACO, the Dragon. A constellation of the northern hemisphere, consisting of a long and straggling line of stars, coiled about Ursa Minor, the Lesser Bear. The Pole of the Ecliptic, or earth's orbital plane, is in this constellation, and round that point the Pole of the Equator, at present close to α Ursæ Minoris (the "Pole Star"), travels in a circle in about 26,000 years. Some 4000 years ago α Draconis was pole-star.

DRAFT. Word used in several senses. One draft is an order to a banker to pay a sum of money to a certain person. Such are used when cheques cannot be employed, in foreign business, for instance. Another draft is a rough copy of a document.

In military speech a draft is a body of soldiers sent to join a unit, perhaps from the depôt to a battalion in India. During the American Civil War the word was used for conscription. In 1863 a law gave power to the president to draft all men between 20 and 45 into the army. The riots which followed were call the **Draft Riots.**

DRAG. (1) A long coach or carriage, generally uncovered and seated round the sides; (2) an apparatus for retarding or stopping the rotation of one wheel or of several wheels in carriages especially; (3) an apparatus consisting of a frame of iron with a bag-net attached, used to recover articles lost in the water.

DRAG-NET. A net drawn along the bottom of a river or pond to catch fish. The use of drag-nets is usually prohibited in rivers where fish breed, as it takes all indiscriminately.

DRAGO DOCTRINE, A doctrine formulated by L. M. Drago, an Argentinian jurist and Minister for Foreign Affairs, and asserting the principle that no power had a right to impose itself by force of arms upon any of the Spanish American nationalities. Drago first advanced his doctrine in 1902, when the British, German, and Italian fleets were blockading the Venezuelan coast to compel President Castro to pay certain claims made upon his government.

DRAGOMIROV, Mikhail Ivanovitch. Russian general, born in 1830, died in 1905. He became known as lecturer on military tactics, and was appointed chief of the Russian general staff at Kiev. During the Russo-Turkish War he distinguished himself at the crossing of the Danube at Sistova, and was wounded at the Shipka Pass. Retired from active service, he was director of the War Academy at St. Petersburg, Governor General of Kiev from 1898 to 1902, and member of the Council of the Empire. His works include: *The Austro-Prussian War, A Study on the Novel "War and Peace," The French Soldier, War is an Inevitable Evil,* and *Duels.*

DRAGOMIROV, Vladimir. Son of the former, was prominent as a commander during the European War, and took part in the offensive in Galicia in 1916. In 1919 he was president of General Denikin's Political Council, and Governor of Kiev.

DRAGON (Gr. *drakon*, "the seeing one," a serpent). This "composite wonder beast" is prominent not only in fairy lore and mediæval romances, but in ancient religious systems. In the mythical history of the East the dragon is the symbol of anarchy and destruction, and the idea was taken over by Christianity, which looked upon the dragon as an emblem of the devil. In Ancient Egypt certain of the deities had serpentine forms, as have still some of the dragons of India, China, and Japan. The Egyptian "fiery flying serpent" is a dragon, as is also the Apep serpent of night and death, through which the sun-barque of Ra was supposed to pass each night.

Biblical references to it as the "worm" include: "Their worm shall not die" (Is. lxvi. 24); "The worm shall eat them like wool" (Is. li. 8); "In that day the Lord, with his sore, and great, and strong sword, shall punish leviathan the piercing serpent," etc. (Is. xxvii. 1); "The great dragon was cast out, that old serpent, he that is called the Devil and Satan" (Rev. xii. 9). See also Ps. lxxxvii. 4, and lxxxix, 10; Amos, ix. 3; and Is. li. 9. Osiris, as the Nile, was a dragon on which were human heads. In the Pyramid Texts he is addressed as "the Great Green" (the Mediterranean Sea), and the one who is "round as the Great Circle (Okeanos)." On the sarcophagus of Seti I. he is "Osiris encircling the Nether World." Set, who slew him, had a "roaring serpent" form and hid in a hole; he resembled Typhon.

The Babylonian dragon Tiamat was the Great Mother of all the deities, and was slain by her descendant Marduk (Merodach), who formed the earth and sky from her body; her blood ran as the flooded rivers to the sea. In India the

drought-demon is a water confiner. When slain by Indra with the thunderbolt, the rainy season ensues. The Naga serpent-gods are dragons who may assume human or half-human, half-reptile forms. They guard treasure and chiefly pearls. Early pearl-fishers believed that the shark was the owner and guardian of pearls. Among the Chinese dragons is the lion-headed shark. All the Chinese dragons have pearls in their mouths, and are supposed to spit out pearls. Dragon deities are connected with the moon, which is "the night-shining pearl," and in Mexico "the pearl of heaven." The Mexican dragon resembles the Chinese, Indian, and Babylonian dragons.

The Indian wonder-beast, the *Makara*, the vehicle of the sea-god Varuna, is similar to the dragon of the Babylonian mother-goddess Ishtar seen on the famous Ishtar gate of Babylon. *Makara* forms include the lion-headed dolphin, the crocodile-headed fish, and the ram-headed fish so like the "goat fish" or "antelope fish" of the Babylonian sea-god Ea, and resembling the Greek horse-headed, dog-headed, and man-headed fish (Tritons). Japanese dragons are serpentine "water fathers," which are prayed to in time of drought.

The Chinese dragons are rain-bringers which sleep during the winter (the season of drought) in pools and rise to fight and thunder in spring. They are hatched from stones as snakes, or from sea-plants, or are transformed fish, or are born from aged pine trees. They are coloured according to their attributes, and may assume human forms or be horse-headed with a snake's tail. That the composite dragon-god is a mixture of several ancient animal-gods is evident by the following description of one class of dragon by a Chinese writer: "His horns resemble those of a stag, his head that of a camel, his eyes those of a demon, his neck that of a snake, his belly that of a clam, his scales those of a carp, his claws those of an eagle, his soles those of a tiger, his ears those of a cow."

Dragons may transform themselves into fishes, snakes, crows, dogs, rats, cows, sharks, whales, crocodiles, etc., as well as human beings. The "will o' wisp" is the "dragon lantern," and the dragon pearl is the "jewel that grants all desires" in India, China, and Japan. Dragon herbs cure diseases and prolong life. Dragons carry souls to the Celestial regions, or draw vehicles in which souls stand. This Far Eastern belief existed in Ancient Crete too. On a Cretan sarcophagus is a chariot drawn by two griffins (forms of the dragon) in which stands a woman, probably a goddess, and a swathed pale figure, the deceased. Shakespeare has interesting dragon references, including:

> The dragon wing of night o'erspreads the earth. . . .
> (*Troilus and Cressida*, v, 8, 17.)
>
> Swift, swift, you dragons of the night, that dawning
> May bare the raven's eye. . . .
> (*Cymbeline*, ii, 2, 49.)

It is believed that the treasure-guarding dragon of the romances had origin in mixed memories regarding the pearl-guarding shark, the fiery flying serpent, and the ancient serpent and crocodile demons of destruction, flood, darkness, and death. The whole idea of dragons may have originated from traditions about the pterodactyls which lived in the Mesozoic period.

The dragon being a symbol of destruction and a power of evil, the slaying of a dragon was considered a great achievement of mediæval heroes, such as King Arthur, Beowulf, Siegmund, and Tristram.—Cf. G. Elliot Smith, *The Evolution of the Dragon*; M. W. de Visser, *The Dragon in China and Japan*.

DRAGON, or **DRAGON-LIZARD.** A name for several species of lizards

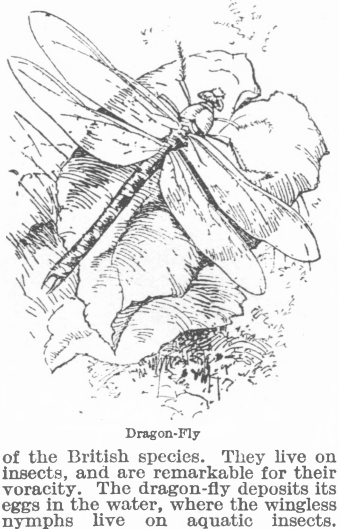
Dragon Lizard

inhabiting South-East Asia. The common flying lizard (*Draco volans*), the best type of the genus, is about 10 or 12 inches in length, the tail being extremely long in proportion to the body. The sides are furnished with peculiar extensions of the skin, resembling wings, which help to support it in the air as it springs from

branch to branch. These wing-like processes are borne by prolongations of five or six of the hindermost ribs, and can be folded up. Its food consists almost exclusively of insects.

DRAG'ONET. The common name of small marine fishes constituting a special family (Callionymidæ). The gemmeous dragonet (*Callionymus lyra*) is found in the British seas. The female is dull brown and much smaller than the male, which is brilliantly coloured with spots and bars of blue on a yellow ground. His first dorsal fin is large and drawn out into a long filament.

DRAGON-FLY. The common name of members of a family (Odonata or Libellulidæ) of neuropterous insects. They have a large head, large eyes, and strong horny mandibles. They are beautiful in form and colour, and are of very powerful flight. The great dragon-fly (*Æschna grandis*) is about 4 inches long, and the largest



Dragon-Fly

of the British species. They live on insects, and are remarkable for their voracity. The dragon-fly deposits its eggs in the water, where the wingless nymphs live on aquatic insects. The nymph stage lasts for a year. The family is of very wide distribution. The small blue Agrion is a common European form, but the familiar Libellula is the most extensively distributed. *See* DEMOISELLE.

DRAGONNADES, or **DRAGONADES.** The name given to the persecutions directed against the Protestants, chiefly in the south of France, during the reign of Louis XIV., shortly before the revocation of the Edict of Nantes in 1685. Bands of soldiers, headed by priests, marched through the villages, giving the Protestant inhabitants the alternative of renouncing their faith or being given over to the extortions and violence of the soldiery. The dragoons were conspicuous in these expeditions, to which they gave their name. The Dragonnades drove thousands of French Protestants out of France.—Cf. Tylor, *The Huguenots in the Seventeenth Century.*

DRAGON'S BLOOD, or **GUM DRAGON.** A resinous juice, usually obtained by incision from various tropical plants, as *Calămus Draco*, *Dracæna Draco*, *Pterocarpus Draco*, etc. It varies in composition, and is often much adulterated. It is opaque, of a reddish-brown colour, brittle, and has a smooth shining conchoidal fracture. It is soluble in alcohol and oil, but scarcely so in water. It is used for colouring varnishes, for staining marble, leather and wood, and for tooth tinctures.

DRAGON TREE (*Dracæna Draco*). A tree-like liliaceous plant, with a stem simple or divided at top, and in old age often much branched. It is a native of the Canaries, and yields the resin known as dragon's blood. It is often grown in greenhouses.

DRAGOON'. A kind of mounted soldier, so called originally from his musket (*dragon*) having on the muzzle of it the head of a dragon. At one time dragoons served both as mounted and foot soldiers, but now only as the former. In the British army there are *heavy* and *light dragoons*. The first dragoon regiment, the Scots Greys, was formed in 1681.

DRAGUIGNAN (drà-gē-nyăn). A town of Southern France since 1793, capital of the department of Var, in a beautiful valley, 41 miles north-east of Toulon. It has some interesting buildings, and manufactures of silk, soap, and leather. Pop. 9971.

DRAINAGE. The term comprises the drainage of areas of country by rivers and streams, the reclamation of areas from the sea, and country formerly marshy, and the provision of culverts and pipe-drains to buildings and towns.

The Fens in Lincolnshire are a notable example of a comprehensive system of drainage by means of open ditches (locally called "drains"), into which the surplus water is lifted by means of wind- and steam-pumps.

Low-lying or flat country often requires a considerable amount of drainage, which is carried out by

means of a regular system of earthenware pipes, laid 2 to 3 feet deep, and from 15 to 35 feet apart. These pipes are porous, from 2 to 3 inches in diameter, laid with butt joints, and lead into larger mains, and thence by open ditches to streams.

A method recently introduced consists in drawing a pointed cylindrical tool, 2 inches in diameter, through the ground at the required depth. This tool is dependent from a thin steel plate, which connects it with the carriage above, so that it can be drawn underground in any desired direction. This system is economical in first cost, but its useful life is considerably less than that of a piped drain, and its use is obviously confined to soils of the heavier variety.

In considering the provision of drainage to water-logged or low-lying land, every care should first be taken to improve the existing natural means of drainage, such as deepening and cleaning out streams and ditches, and removing obstructions.

It should be borne in mind that the object of land drainage is not only to remove the surplus water, but to promote a free and natural circulation of water in the soil, and to allow the mineral constituents of the water to reach the plant roots.

In the drainage of buildings, glazed socketed stoneware pipes are used, varying in diameter from 3 to 9 inches, laid straight in plan and in longitudinal section, and laid to falls, calculated to give a minimum velocity of 3 feet per second when flowing half full. These are laid in trenches, with inspection chambers at all changes in direction, and should be laid on and surrounded with concrete. In bad ground, or under dwelling houses, cast-iron pipes are employed, with special turned and bored joints.

In towns these drains lead into the public sewers, which are similar stoneware pipes from 6 to 18 inches in diameter, larger sizes being constructed in brickwork or concrete, and either circular or egg-shaped form. In populous areas these sewers attain very large dimensions, the northern outfall sewers of London consisting of five parallel sewers, each 9 feet in diameter. *See* DRAINING.—BIBLIOGRAPHY: G. S. Mitchell, *Handbook of Land Drainage*; Moore and Silcock, *Sanitary Engineering*; Gilbert Thomson, *Modern Sanitary Engineering*.

DRAINAGE TUBES. Are fenestrated india-rubber tubes used in surgery to effect the gradual removal of the contents of a suppurating cavity. The inner end of the tube is in the cavity, and the outer end projects above the skin surface, and is usually fixed by a stitch or safety-pin, and covered with suitable dressings.

DRAINING. In agriculture, a method of improving the soil by withdrawing the superfluous water from it by means of channels that are generally covered over. Plants cannot thrive unless there is free circulation of air and water round their roots. The successful practice of draining in a great measure depends on a proper knowledge of the superficial strata, of their situation, relative degrees of porosity, etc. Some strata allow water to pass through them, while others more impervious force it to run or filtrate along their surfaces till it reaches more level ground below. In general, where the grounds are in a great measure flat and the soils of materials which retain the excess of moisture, they require artificial means of drainage to render them capable of yielding good crops whether of grain or grass.

The wetness of land, which makes it inferior for agricultural purposes, may appear not only as surface-water but as water which flows through the lower strata, and to draw off these there are the two distinct operations of surface-draining and under-draining. The rudest form of open drains are the deep furrows lying between high-backed ridges, and meant to carry off the surplus water after the soil is completely saturated, but in doing so they generally carry off also much of the best of the soil and of the manure which has been spread upon it.

The ordinary ditch is a common form of water-course useful in certain cases, as in hill pastures. But covered drains at a depth of 4 feet or so are the common forms in draining agricultural lands. They are generally either *stone-drains* or *tile-drains*. Stone-drains are either formed on the plan of open culverts of various forms, or of small stones in sufficient quantity to permit a free and speedy filtration of the water through them. The box-drain, for instance, is formed of flat stones neatly arranged in the bottom of the trench, the whole forming an open tube. In tile-drains, tiles or pipes of burnt clay are used for forming the conduits. They possess all the qualities which are required in the formation of drains, affording a free ingress to water, while they effectually exclude earth, as well as other injurious substances, and vermin. Drainage tiles and pipes have been made in a great

variety of forms, the earliest of which, since the introduction of thorough draining, was the horse-shoe tile, so called from its shape. These should always rest on soles, or flats of burned clay. Pipe tiles, which combine the sole and cover in one piece, have been made of various shapes, but the best form appears to be the cylinder.

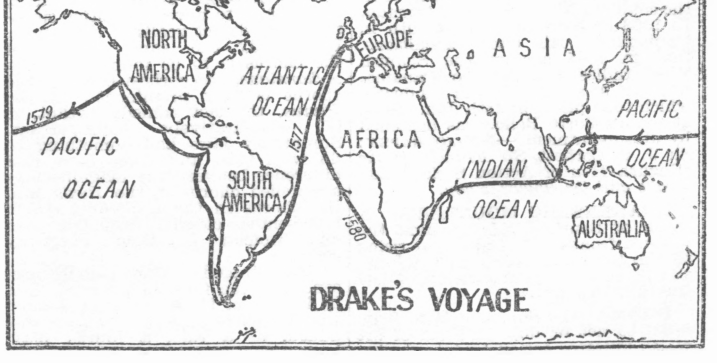
An important department of draining is the draining off of the waters which are the sources of springs. The judicious application of a few simple drains, made to communicate with the watery layers, will often dry swamps of great extent, where large sums of money, expended in forming open drains in the swamp itself, would leave it but little improved. In the laying out of drains the first point to be determined is the place of outfall, which should always afford a free and clear outlet to the drains, and must necessarily be at the lowest point of the land to be drained. The next point to be determined is the position of the minor drains. In the laying out of these the surface of each field must be regarded as being made up of one or more planes, as the case may be, for each of which the drains should be laid out separately.

Level lines are to be set out a little below the upper edge of each of these planes, and the drains must then be made to cross these lines at right angles. By this means the drains will run in the line of the greatest slope, no matter how distorted the surface of the field may be. All the minor drains should be made to discharge obliquely into mains or submains, and not directly into an open ditch or water-course. As a general rule, there should be a main to receive the waters of the minor drains from every 5 acres.

The advantages of drainage are obvious. In the first place it brings the soil into a more suitable condition for the growth of plants, aiding in producing the finely divided and porous state which allows the roots and rootlets to spread themselves at will in order to obtain the needed supplies of food, air, and moisture. It also allows the sun's rays to produce their full effect on the soil and plants. In the presence of stagnant water a great part of this effect would be lost. *See* DRAINAGE.

DRAIN-TRAP. A contrivance to prevent the escape of foul air from drains, while allowing the passage of water into them. They are of various forms. In the traps represented below it will be seen that there must always be a certain quantity of water maintained to bar the way against the escape of the gas from the drain or sewer. When additional liquid is conveyed to the trap, there is, of course, an overflow into the drain. In older types of drains the gas was prevented from escaping by a metal plate thrown obliquely over the drain mouth and dipping into the water in the vessel beyond it.

DRAKE, Sir Francis. An English navigator, born at Tavistock, in Devonshire, in 1539, or according to some authorities in 1545. He served



as a sailor in a coasting vessel, and afterwards joined Sir John Hawkins in his last expedition against the Spaniards (1567), losing nearly all he possessed in that unfortunate enterprise. Having gathered a number of adventurers round him, he contrived to fit out a vessel in which he made two successful cruises to the West Indies in 1570 and 1571. Next year, with two small ships, he again sailed for the Spanish Main, captured the cities of Nombre de Dios and Vera Cruz, and took a rich booty which he brought safely home.

In 1577 Drake made another expedition to the Spanish Main, having this time command of five ships. On this the most famous of his voyages Drake passed the Straits of Magellan, plundered all along the coasts of Chile and Peru, sacked several ports, and captured a galleon laden with silver, gold, and jewels, to the value of perhaps £200,000. He then ran north as far as 48° N. lat., seeking a passage to the Atlantic, but was compelled to return to Port San Francisco on account of the cold. He then steered for the Moluccas, and holding straight across the Indian Ocean doubled the Cape of Good Hope, and arrived at Plymouth 3rd Nov., 1580, being thus the first of the English circumnavigators.

As there was no war between England and Spain, the proceedings of Drake had a somewhat dubious character, but the queen maintained that they were lawful reprisals for the action of the Spaniards, and showed her favour to Drake by knighting him on board his own ship. Five years afterwards Drake was again attacking the Spaniards in the Cape Verde Islands and in the West Indies, and in 1588 particularly distinguished himself as vice-admiral in the conflict with the Spanish Armada. In 1593 he represented Plymouth in Parliament. His later expeditions, that in 1595 against the Spanish West Indies and that to Panama, were not so successful, and his death, which took place on 28th Jan., 1596, at sea off Porto Bello, was hastened by disappointment.—BIBLIOGRAPHY: Sir J. S. Corbett, *Sir Francis Drake* (English Men of Action Series), and *Drake and the Tudor Navy*.

DRAKENBERG MOUNTAINS. A range of South Africa forming the western frontier of Natal, and rising to the height of 10,763 feet (Montaux-Sources), a continuation of the Quathlamba range.

DRAMA (Gr. *drama*, action, from *drān*, to act or do). A form of art which imitates action by introducing real persons to represent the fictitious characters, and to carry on the story by means of action and dialogue.

Greek Drama. The Greek drama was religious in its origin. It arose from the dithyrambs or songs composed in honour of Dionysus, the god of all vegetation, though identified most closely with the vine. When vegetation died in winter, this was considered to be the death of Dionysus; when it bloomed anew in the spring, this was thought to be the god's resurrection. The one event was celebrated with gloomy song and dance, and the other with merry revels and crude indecency. The history of Greek drama is the history of the decline and fall of the chorus. At first the chorus was the whole play, and in the *Supplices* of Æschylus, the earliest extant tragedy, the chorus played a predominating part. According to tradition, Thespis (about 535 B.C.) introduced for the first time a masked actor, who carried on a dialogue with the leader of the chorus. Æschylus introduced a second actor, and Sophocles a third. It is thought that there never were more than three actors, but, of course, duplication of parts was permitted.

There were also frequently mute characters (*kōpha prosōpa*) on the stage. Dialogue became more important in the later plays of Æschylus, and chorus became less important; Sophocles developed his dialogue in masterly style, though his choruses are among the most beautiful things in all Greek poetry; in Euripides the choruses, however lovely in themselves, are less an integral part of the drama than they were in the plays of his predecessors. In fact the chorus acted as a clog in the freedom of the dramatist, who wished to develop exciting situations and depict realistic characters. In comedy the same decline of the chorus is to be found; in the *Acharnians*, the earliest comedy, the chorus is very prominent; in the *Plutus*, the last comedy extant, it is comparatively unimportant. Sumptuary laws had something to do with this, and there is a vast difference between the magnificently apparelled chorus in the *Birds*, and the chorus in the *Lysistrata*, which represented elderly Athenian men and women in their everyday costume.

Greek tragedies were usually presented in the form of trilogies, that is, in sets of three plays all dealing with the same subject. To these was added, as a rule, a fourth play, known as a satyr-play. The *Cyclops*

of Euripides is the only example extant of this kind of play. It is not very amusing, though it contains a certain amount of horse-play and high spirits. The satyr-play was intended to lighten the gloom of the three preceding tragedies. We have one complete trilogy preserved—the magnificent *Oresteia* of Æschylus, consisting of the *Agamemnon, Choephoræ*, and *Eumenides*—plays which are bracketed with *Lear* and *Othello* as the highest and most majestic of all tragedies.

In later times the three plays of the trilogy dealt with different subjects. The tragedies to be performed were carefully selected by some of the Athenian magistrates, and at the festival prizes were given for the best tragedy, on the recommendation of a carefully chosen jury. Comedies were presented one at a time; prizes were offered for the best of them also. Greek tragic actors wore long flowing robes, and added to their height by means of the *cothurnus* or thick-soled boot; it is believed that they wore masks with some sort of speaking-trumpet in the mouth, so that their words would be audible to the vast audience which assembled in the theatre, a huge circular open-air amphitheatre.

Each of the three Greek tragic writers whose work has been preserved is supreme in his own way. Æschylus's lyric dramas are among the greatest writings of all time; the plays of Sophocles are masterpieces of deft construction, of well-woven plot, and ironic dialogue; and his choruses are lyrics of the greatest beauty. Æschylus is more titanic; Sophocles is more humane. Euripides, the latest of the three, is a great poet and a champion of the weak, such as women and slaves; moreover, he sees deeply into men's hearts. He is really the founder of romantic drama, through the Roman Seneca, who imitated him. Of Greek comic poets we only possess one, but he is a host in himself. Aristophanes is a Gargantuan mirth-maker; he bestrides the narrow world like a Colossus. He plays with a master's hand upon every note in the whole comic gamut. His works, owing to the conditions of the old comedy, were very frequently political and highly personal in their tone. The later plays are less so.

The *Birds, Clouds*, and *Frogs* are among the very greatest comic creations; only a little less great is the *Lysistrata*, where a serious purpose is veiled by intense indecency. The old comedy, however, was essentially the product of its own age; it did not invite, or even permit, imitation. The new comedy, of which Philemon, Menander, and Diphilus were the principal writers, gradually supplanted it. Their plays were more or less romantic comedies with carefully constructed plots. They are all lost, but we may gain some idea of them from Plautus and Terence, and from the fragments which have been found, some of them fairly recently.

Roman Drama. Roman drama is not intrinsically good; it is in many respects a weak imitation of Greek drama, but it has been very much more important in its influence. Early English, French, and Italian dramatists all turned to Seneca as a model for tragedy, and to Plautus and Terence as models for comedy. This was partly due to the fact that though most of them had small Latin, they had less Greek; but it was partly because the Latin writers were easier to imitate. Italy had native farces, known as Atellan Fables, which were not without their influence on the development of comedy.

These plays were broadly farcical, and dealt almost entirely with country life. The two great Roman comedy writers, Plautus and Terence, based their work, however, upon the new comedy of Greece, especially upon the plays of Menander and Diphilus. Plautus is decidedly coarse at times, and sometimes his fun is too much like that of a fourth-form boy at a public school, but his work is wholesome and vigorous, and he is a more creative and virile writer than Terence. Terence's plays are somewhat weak dramatically, but are written in a style of great beauty. He was a careful literary craftsman. Seneca, the only Roman tragic writer, had an immense influence on later dramatists. It is hard to account for this. He based his work upon Euripides, but he suppressed everything that makes Euripides tender and human.

Senecan tragedy abounded in bloodshed and horrors; the speeches are full of pompous rant, and their metre is most monotonous. Some of the choruses are good rhetorical writing, though scarcely great poetry. Seneca's influence pervades all our early tragedy; it is clearly seen in *Gorboduc* and in Jonson's *Sejanus* and *Catiline*; even Shakespeare is not without traces of it. As the Roman Empire declined so did the Roman stage; finally nothing was performed save pantomime, in the proper sense of the word, where everything was done in dumb-show. This appeared to content the populace of the Roman Empire, even as

the cinema seems to satisfy the citizens of a later and perhaps greater empire.

Mediæval Drama. There is no drama between the death of Seneca and the Renaissance, unless we except the six curious "comedies" of the nun Hrosvitha of Gandersheim (born about A.D. 935). These plays are based upon Terence, though they do not follow their model closely. They are, of course, written in Latin. They have some vivid dramatic touches, and frequent felicities of expression. They were probably intended for recitation, not for representation on the stage. They must be regarded as an isolated phenomenon.

The Church for long discouraged drama, but ended by adapting it to its own purposes. As in Greece, therefore, drama originated in England from religion. The priests impressed certain events in sacred history upon the minds of their congregation by means of dramatic performances which at first took place actually in the church. Thus the removal of the stone from the mouth of the sepulchre and the discovery of the empty tomb was performed at Easter, and the finding of the Babe in the manger by the three Magi was represented at Epiphany. It is easy to understand how performances of this sort arose from the singing of suitable anthems on festival days. The Oberammergau passion-play is a somewhat sophisticated representative of these liturgical plays; it cannot be called a survival, as it only dates back to 1633.

These mystery-plays, so called because they were produced by the trade-guilds (Lat. *ministerium*, a trade), were eventually brought out into the market-place on wagons, and were moved round to various "stations" in the town, different plays being performed at each station. A distinction is sometimes made between mystery and miracle-plays, the former being defined as dealing with gospel events only, while the latter deal with incidents derived from the legends of the saints.

Several collections of these plays survive—the Wakefield, Chester, and Coventry plays. They are written in a lively fashion, and are often naively humorous, the most sacred Bible characters being introduced along with English yokels and crudely comic persons. The next development of the drama was the morality play or allegory; the well-known *Everyman* is the most finished specimen of this kind of play which we possess. Here personifications of Virtues and Vices formed the dramatis personæ; the Devil was usually included in the cast. Moralities were in ways less crude than mysteries, as they consisted of an allegory worked out by means of a more or less continuous plot, while mysteries consisted merely of a series of isolated scenes.

Interlude. The interlude is another early species of drama; it marks a still further advance. Interludes were both farcical and theological in their subjects, and played an important part in the controversies at the time of the Reformation. John Heywood (1497-1580) is the most important writer of interludes, the controversial plays of John Bale (1495-1563) serving to link the interlude to the regular drama, which began gradually to spring up.

Elizabethan Drama. The first English comedy, *Ralph Roister Doister*, appeared in 1551. It is by Nicolas Udall, and is based upon the *Miles Gloriosus* of Plautus. *Gammer Gurton's Needle*, a more native production, thought to have been by John Still, who was master of St. John's College, Cambridge, and Bishop of Bath and Wells, appeared about 1566. Drama now improved rapidly, and was soon to attain perfection in Shakespeare. Marlowe, Kyd, Greene, Lyly, Nash, Lodge, and Peele all helped to prepare the way. The greatest of these is Marlowe, who died at the age of twenty-nine, leaving behind him the great plays *Tamburlaine* (1588), *Faustus*, and *Edward II.* In his development of blank verse he contributed greatly to the success of the drama.

The earliest tragedy, *Gorboduc* (1562), is incredibly stiff and wooden in its versification. Marlowe made of blank verse an instrument that would sound any note of pathos or sublimity. In the plays of Shakespeare (1564-1616) drama reached its greatest height. In comedy, tragedy, history, in handling dramatic situations, and in liquid perfection of verse, he is supreme. Like the very greatest masters, he founded no school, and his contemporaries owe little to him. While they are all put in the shade by his myriad-minded genius, they are all partakers with him in the glory of their age, and are all great in themselves.

Jonson (1573-1637) is one of the most important, as he to some extent founded a school and exercised considerable influence over later writers. He was a scholarly and laborious playwright, who over-elaborated some of his work but who was a masterly adept at constructing a play, and a vigorous realist. Chapman (1559-1634), Dekker (1570-

1641), and Marston (1575-1634) were all good workmanlike dramatists. Beaumont and Fletcher produced between them a great body of work, some of inferior quality, but all of great power. In some respects their work is less unlike that of Shakespeare than the work of other Elizabethans. Middleton, Webster, Tourneur, Thomas Heywood, and Massinger are all excellent in their way, Massinger in particular being a master of stage-craft. Shirley and Ford conclude the list of the great Jacobean dramatists. The Puritans caused the theatres to be closed in 1642.

Spanish and French Drama. Meanwhile a similar outburst of dramatic activity was taking place on the Continent. In Spain, Lope de Vega (1562-1634) wrote a prodigious quantity of plays, and wrote them with much brilliance. Calderon wrote some beautiful plays, several of which have been translated by Edward Fitzgerald. Cervantes, though much better known as a novelist, wrote many good plays. The Spanish school directly inspired Corneille (1606-1684) to write his play *Le Cid*, and so begin the great age of classical French tragedy. Racine (1639-1700) is the other great name. French classical drama, though somewhat fettered by its observance of laws that were wrongly considered essential, is extremely dignified and beautiful. In Molière (1622-73) France possesses the greatest of all writers of society comedies. He is as supreme in his kingdom as Shakespeare is in his empire. He borrowed from his predecessors with all the licence of genius, but he payed usurious interest on his borrowings.

Restoration Drama. When the theatres were reopened after the Restoration, many dramatists began to write. Restoration comedy was largely based on Molière, who was brutalized by Wycherley, and adapted but not improved by Congreve. Congreve was, however, a master of sparkling dialogue, and in one play, *The Way of the World*, he has shown himself not unworthy of comparison with his master. Vanbrugh and Farquhar are the other two important writers of comedies; all their comedies are more or less disfigured by cynicism and immorality, the reaction after the Puritan restraint. Restoration tragedy is much less important than Restoration comedy. Otway, Lee, and Southerne are its chief exponents.

Eighteenth Century Drama. Some of these dramatists bring us into the eighteenth century, which was not on the whole prolific in good plays. Fielding wrote many amusing farces, but all were more or less hack-work. At a later period Foote, Cumberland, and the two Colmans wrote good acting plays, which have not lived. The two plays of Goldsmith and several of the plays of Sheridan still hold the stage. Sheridan owed much to the Restoration dramatists, especially Vanbrugh, but as he improved his originals in many respects, and made them much more presentable in decent society, he is entitled to most of the reputation he long enjoyed.

In France, Marivaux (1678-1763) wrote sentimental comedies, while Beaumarchais, whose own life was more exciting and varied than most plays, wrote comedies with brilliant plots. In Italy, Maffei, Goldoni, and Alfieri are notable dramatists; the last named wrote propaganda in the disguise of tragedy. In Germany, Lessing by precept and example inaugurated the "romantic movement"; Schiller and Goethe are the two greatest names associated with the stage. *Wallenstein* in particular is a good chronicle-play, while *Faust* is considered one of the greatest of all German plays.

Nineteenth and Twentieth Century Drama. Victor Hugo led the Romantic movement in France, and wrote many great plays, such as *Hernani* and *Ruy Blas*. De Musset wrote his plays, which he called *proverbes*, under the same influence, and later followers of this school are Rostand and the Belgian M. Maurice Maeterlinck. The French dramatists Augier, Scribe, and Sardou had an overwhelming influence on the English stage, not altogether for its good.

English drama was at a low ebb in the middle of the nineteenth century. Lytton's plays, though sometimes performed still, are extremely theatrical. Boucicault, who made a great success by dramatizing "the pathos of Paddy," is not a great writer. H. J. Byron was an inveterate punster and writer of burlesques of no value. One of his plays, *Our Boys*, was acted for many years. Robertson is the most outstanding author of what is known as "the cup and saucer" school of comedy. His plays are very much acting plays; they are not literature, and are quite removed from real life. Gilbert was a man of great gifts, but though some of his farces and comedies are good, he was not a master of drama as he was of *libretti* writing. He did little to improve the drama of his day. Sir A. W. Pinero began his career as a dramatist under the ægis of Robertson, but continued it under that of Ibsen.

Ibsen. Ibsen (1828-1906) exercised a not altogether wholesome influence upon English drama for a considerable time. His plays are extremely well-constructed, and he refused to tolerate many conventions, such as asides and soliloquies. In many of his plays he adopted the retrospective method, where the plot consists not so much in anything being done as in the gradual discovery of what has been done long before the rise of the curtain. Sophocles had done this most skilfully in *Œdipus Tyrannus*, but Ibsen carried the method to perfection in *The Wild Duck* and *Rosmersholm*. All Ibsen's plays are more or less unpleasant, and he did not make many of his characters sympathetic. Pinero, after writing several farces, wrote *The Second Mrs. Tanqueray* (1893), a masterpiece after the style of Ibsen. *His House in Order* is a cleverly constructed example of the retrospective method.

H. A. Jones (born 1851) has written many excellent and extremely powerful plays, of which the best known are *The Liars* and *The Case of Rebellious Susan*. G. Bernard Shaw (born 1856) has written a number of plays, perhaps the one most entitled to lasting fame being *St. Joan*, which has been translated into most European languages. Several of his plays are spoilt by his tendency to turn them into propaganda. Oscar Wilde (born 1854) wrote comedies of wit.

In the post-war theatre John Galsworthy (1867) held a prominent place. His plays are marked by earnestness in presenting social and ethical evils and his fair-minded treatment of the subjects. They include *The Silver Box*, *Strife*, *Justice*. Sir J. M. Barrie (1860) has written several plays; in one at least, *Peter Pan*, he has made a bid for immortality. Other plays are *What Every Woman Knows*, *Dear Brutus*, etc.

Other dramatists of note are Somerset Maugham, whose comedy, *Our Betters*, is a brilliant satire; Frederick Lonsdale, a master of polished dialogue; A. A. Milne, Clemence Dane, Harley Granville Barker, Stanley Houghton, Allan Monkhouse, James Bridie, R. C. Sherriff, whose war play, *Journey's End*, is famous, and Noel Coward, a prolific and brilliant writer for the theatre.

Writers of verse drama include John Drinkwater, Thomas Hardy, Gordon Bottomley, Laurence Housman, and Laurence Binyon.

Mention must be made of the Irish dramatists who wrote for the Abbey Theatre, which was opened in 1904 in Dublin. Prominent among these are Lady Gregory, W. B. Yeats, who wrote, among other plays, *The Land of Heart's Desire*; J. M. Synge, whose play, *The Playboy of the Western World*, is celebrated; Lennox Robinson (*The Whiteheaded Boy*), Sean O'Casey (*Juno and the Paycock*), Lord Dunsany, and St. John Ervine.

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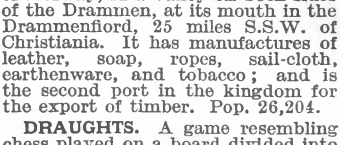
DRAMMEN, or **DRAM.** A seaport of Norway, in a valley on both sides of the Drammen, at its mouth in the Drammenfiord, 25 miles S.S.W. of Christiania. It has manufactures of leather, soap, ropes, sail-cloth, earthenware, and tobacco; and is the second port in the kingdom for the export of timber. Pop. 26,204.

DRAUGHTS. A game resembling chess played on a board divided into sixty-four checkered squares. Each of the two players is provided with twelve pieces or "men" placed on every alternate square at each end



Draughts Board

of the board. The men are moved forward diagonally to the right or left one square at a time, the object of each player being to capture all his opponent's men, or to hem them in so that they cannot move. A piece can be captured only when the square on the diagonal line behind it is unoccupied. When a player succeeds in moving a piece to the farther end of the board (the crown-head), that piece becomes a king, and has the power of moving or capturing diagonally backwards or forwards. When it so happens that

neither of the players has sufficient advantage in force or position to enable him to win, the game is drawn. *Checkers* is the common American name of the game.

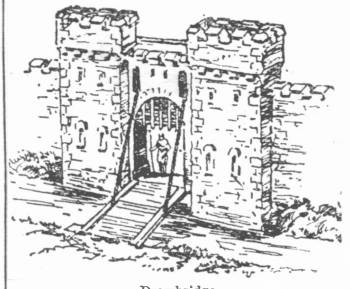
The game does not offer the same scope for brilliance and originality as the sister game of chess, but still is much more profound than is generally supposed. It has been cultivated in Britain, and especially in Scotland, certainly for over two hundred years, and has served as a field of exercise for some extremely able intellects, which but for it might hardly have been exercised at all.

Famous Players. Among famous players are: Andrew Anderson of Carluke, who published a celebrated work on the game in 1852; James Wyllie, the "Herd Laddie," who travelled over the world playing exhibition matches, and was for many years world's champion; Robert Martins, English champion about 1870, who played several matches with Wyllie; R. D. Yates, a young American player, who defeated Wyllie for the championship, but shortly afterwards gave up the game; James Ferrie, of Coatbridge, who in 1894 defeated Wyllie and became champion, to be defeated in turn by Richard Jordan of Edinburgh in 1896, Robert Stewart, of Fifeshire, many times Scottish champion, and probably the strongest player now living.—BIBLIOGRAPHY: James Lees, *A Guide to the Game of Draughts*. Early works by Payne, Sturges, Drummond, Hay, Anderson, and Bowen are now very scarce. There are several periodicals devoted to the game; and some newspapers, notably *The Glasgow Weekly Herald* give it a column weekly.

DRAVE, or **DRAU** (drä've, drou). A European river which rises in Tyrol, flows E.S.E. across the north of Illyria and the south of Styria, and between Hungary on the left and Croatia and Slavonia on the right, and, after a course of nearly 400 miles, joins the Danube 14 miles east of Essek. It is navigable for about 200 miles.

DRAVID'IAN. A term applied to the vernacular tongues of the great majority of the inhabitants of Southern India, and to the people themselves who inhabited India previous to the advent of the Aryans. The affinities of the Dravidian languages are uncertain. The family consists of the Tamil, Telugu, Canarese, Malayâlam, Tulu, Tuda, Gond, Rajmahal, Oraon, etc. Only the first four mentioned have a literature, that of the Tamil being the oldest and the most important. Originally the word Dravidian was a purely philological term, but it is now used in an ethnological sense as well.—Cf. R. Caldwell, *Comparative Grammar of the Dravidian or South Indian Family of Languages*.

DRAWBRIDGE. A bridge with a lifting floor, such as was formerly used for crossing the ditches of fortresses, or any movable bridge over a navigable channel where the height of the roadway is insufficient to allow vessels to pass underneath. Modern drawbridges across rivers, canals, the entrances of docks, etc., are generally made to open horizontally, and the movable portion is



Drawbridge

called a bascule, balance, or lifting bridge, a turning, swivel, or swing bridge, or a rolling bridge, in accordance with the mode in which it is made to open.

Swing-bridges are usually divided into two parts meeting in the middle, and each moved on pivots on the opposite sides of the channel, or they may move as a whole on a pivot in the middle of the channel. Rolling bridges are suspended from a structure high above the water, and are propelled backwards and forwards by means of rollers.

DRAWINGS. The term "drawings" is usually taken to mean drawings of an architectural or engineering nature, such as the plans of a new building prepared by an architect, or the designs for engineering works, or for machinery produced by an engineer.

Three methods are commonly made use of in preparing drawings, (1) Orthographic, which represents the subject under consideration in one plane only, and from which dimensions may be scaled off, and which is the normal method of preparing an engineering drawing. (2) Perspective or radial projection is made use of by an architect for displaying the elevations of a building,

and gives a truer appreciation of the actual appearance of the building than can be obtained by orthographic projection. (3) Isometric projection enables one to show the length, breadth, and thickness of an object drawn to scale on the one drawing. Such a drawing is really composed of three sets of parallel straight lines, and is not strictly a true representation of the object as it would appear to the eye. It has the great advantage, however, that measurements may be directly scaled from it, and lines which are parallel in the object are also parallel in the drawing.

DRAYTON, Michael. An English poet, born in 1563, is said to have studied at Oxford, and afterwards held a commission in the army. The poem by which his name is chiefly remembered is his *Polyolbion* (1622, reprinted in 1890), a sort of topographical description of England. It is generally extremely accurate in its details, with, at the same time, many passages of true poetic fire and beauty. Other works are his *Nymphidia, the Court of Fairy*; *The Barons' Wars*; *The Legend of Great Cromwell*; *The Battle of Agincourt*; besides numerous legends, sonnets, and other pieces. He died in 1631, and was buried in Westminster Abbey.—Cf. O. Elton, *Michael Drayton: a Critical Study*.

DRAYTON MARKET, or DRAYTON-IN-HALES. A town, England, county Salop, 19 miles north-east of Shrewsbury. It has a church, supposed to have been erected, with exception of the steeple, in the reign of William I. Paper and hair-cloth are made. Pop. (1931), 4749.

DREADNOUGHT. British warship. There have been several warships of this name. One fought against the Spanish Armada and another at Trafalgar. The latter was long used as a hospital, being moored off Greenwich. The name is perpetuated in the Dreadnought Hospital there.

The ninth Dreadnought was an entirely new type of battleship and gave her name to a large class. She was laid down in 1906 and was armed with ten 12 in. guns, earlier ships having only four. Her only other guns were small ones for dealing with torpedo boats. There were no guns of intermediate size as there had been in earlier warships. The Dreadnought was 526 ft. long and displaced 17,900 tons. Her ten guns were so arranged that eight of them could fire on either side. The idea of the Dreadnought was taken up by other navies and their strength was calculated in Dreadnoughts. After a time ships carrying still larger guns were built. These are classed as super-Dreadnoughts.

DREAMS. Trains of ideas which present themselves to the mind during sleep. The principal feature of the state of dreaming is the absence of conscious control over the current of thought, so that all kinds of fantastic notions, which in the waking state would at once be put aside, are woven into the texture of the dream. The usual content of dreams consists of aspirations or dreads, which the dreamer had recently entertained or experienced, mixed up with incidents which excited intense emotion at some earlier period of the individual's history, and especially in early childhood. The memory of unpleasant experiences, such, for example, as the horrors of trench warfare, which is repressed in the waking state, tends to force itself on the individual's attention when the conscious control is relaxed in sleep, and to give rise to disturbing dreams which may become so intense as to interfere with sleep and cause insomnia. The only rational remedy for this distressing trouble is to discover the painful incident and persuade the patient frankly to face it and not "try to forget."

In recent years S. Freud has placed the study of dreams upon a scientific basis. He maintains that dreams represent the fulfilment of wishes. There is usually an utter want of coherency in the images that appear before the mental eye, but this excites no surprise in the dreamer. Occasionally, however, intellectual efforts are made during sleep which would be difficult to surpass in the waking state. It is said that Condillac often brought to a conclusion in his dreams reasonings on which he had been employed during the day; and that Franklin believed that he had been often instructed in his dreams concerning the issue of events which at that time occupied his mind. Coleridge composed from 200 to 300 lines during a dream: the beautiful fragment of *Kubla Khan*, which was all he was able to commit to paper when he awoke, remains a specimen of that dream-poem.

Dreams are subjective phenomena dependent on natural causes. They are retrospective and resultant instead of being prospective or prophetic. The latter opinion has, however, prevailed in all ages and among all nations; and hence the common

ractice of divination or prophesying y dreams, that is, interpreting them s presages of coming events. Some uthorities declare that all our reams take place when we are in rocess of going to sleep or becoming wake, and that during deep sleep he mind is totally inactive. This is lenied by the majority of philo- ophers, and with apparent reason.—

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DREISER, Theodore. American writer. Born Aug. 27, 1871, in Indiana, he was educated there. In 1892 he joined the staff of a newspaper at St. Louis, but soon became an editor in New York. In 1907 he was made editor-in-chief of the Butterick Publications. In 1900 Dreiser published *Sister Carrie* and then followed novels, short stories and essays in quick succession. These include *The Financier, A Hoosier Holiday, Twelve Men, Accented and Declaimed*, and *A Gallery of Women*. His best-known work is *An American Tragedy*. In *A Book about Myself* and *Dawn* he relates his own life story.

DRENTHE (dren'te). A province of Holland, bounded by Hanover, Overyssel, Friesland, and Groningen; area, 1029 sq. miles. It is in general more elevated than the surrounding provinces, especially in the centre. The soil is generally poor, and the surface largely consists of heath and morass, but the province is famed for its horses and cattle. Drenthe is remarkable for the great number of so-called "giants' graves" or barrows scattered over the country. Its capital is Assen. Pop. 225,591.

DRES'DEN. The capital of the Republic (former kingdom) of Saxony, is situated in a beautiful valley on both sides of the River Elbe, which is here spanned by four stone bridges and an iron railway bridge. It is first mentioned in history in 1206, and has been the residence of the sovereigns since 1485; was greatly extended and embellished by Augustus the Strong (1694-1736), and rapidly increased during the nineteenth century.

Among the chief sights are the museum (joined on to an older range of buildings called the Zwinger), a beautiful building containing a famous picture-gallery and other treasures; the Japanese palace (Augusteum), containing the royal library (founded by the Elector Augustus in the sixteenth century) of 570,000 volumes, besides a rich collection of manuscripts; the Johanneum, containing the collection of porcelain and the historical museum, a valuable collection of arms, armour, and domestic utensils, belonging to the Middle Ages. The palace, built about 1530, restored and remodelled externally between 1890 and 1902, and until 1918 the residence of the kings of Saxony, has also a fine interior, and contains (in what is called the Green Vault) a valuable collection of curiosities, jewels, trinkets, and works of art. The theatre is one of the finest structures of the kind in the world.

The city is distinguished for its excellent educational, literary, and artistic institutions, among which are the Technical High School, much on the plan and scale of a university; the Conservatory and School of Music; and the Academy of Fine Arts. The manufactures are not unimportant, and are various in character; the china, however, for which the city is famed, is made chiefly at Meissen, 14 miles distant.

The commerce is considerable, and has greatly increased since the development of the railway system. The chief glory of Dresden is the gallery of pictures, one of the finest in the world. The pictures number about 3000, and comprise many fine specimens of the Italian, Dutch, and Flemish schools. Besides this fine collection the museum contains also engravings and drawings amounting to upwards of 350,000. There is also a sculpture-gallery, the Albertinum.

Dresden, being thus rich in treasures of art and favoured by a beautiful natural situation, is the summer resort of many foreigners. It suffered severely in the Thirty Years' War, and also in 1813, when it was the headquarters of Napoleon's army. It was occupied by the Prussians in 1866, but was evacuated in the following spring. Pop. (1926), 625,016.

DRESDEN, Battle of. A battle fought in 1813 (26-27th Aug.), between the French under Napoleon and the Allies under Schwarzenberg). Napoleon had come to the relief of the city, which was occupied by the French. The Allies assaulted and bombarded the city, and soon after a great pitched battle was fought (27th Aug.), the Allies being defeated.

DRESDEN CHINA. A delicate, semi-transparent, highly finished china made at Meissen, 14 miles from Dresden. The manufacture resulted from an accidental discovery made by Böttger, a young chemist, in 1710, and the vases, statuettes,

Dresden China Candelabrum

groups of figures, candelabra, and clocks, manufactured during the eighteenth century are highly prized.

DREUX (*dreu*; **DUROCASSIS** or **DROCÆ** of the Romans). A French town, department of Eure-et-Loir, on the Blaise, near to where it joins the Eure, 20 miles N.N.W. of Chartres. It is built at the foot of a hill crowned by a dilapidated castle, which contains a chapel, founded in 1142; to which has been added the costly mausoleum of the Orleans family. A battle took place near the town in 1562 between the Royalists under Montmorency and the Huguenots under Condé, in which the latter were defeated. Pop. 10,910.

DREYFUS, Alfred. Captain of artillery and general staff-officer in the French army, was born of a Jewish family in Mulhouse, Alsace, in 1859. In Oct., 1894, he was arrested on a charge of communicating military documents to a foreign Government, supposed to be Germany; and at a secret court-martial, which sat in December, he was condemned to public degradation and lifelong imprisonment. Early in 1895 he was sent to the Ile du Diable (Devil's Island), near Cayenne, to undergo his sentence.

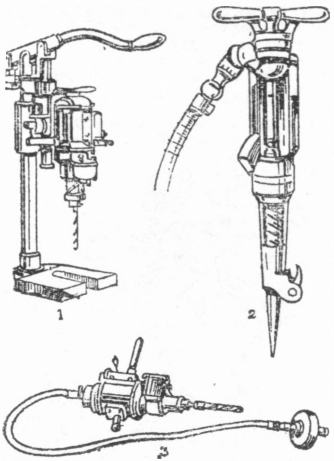
About the middle of the same year Colonel Picquart became head of the Intelligence Department, and in the course of his official duties discovered various circumstances tending to throw doubt on the correctness of the court-martial's decision, and pointing to another officer, of the name of Esterhazy, as the real traitor. Picquart was superseded by a Colonel Henry in Nov., 1897, and in the following January Esterhazy, charged by a brother of the condemned man with having written the *bordereau*, or memorandum, which was the chief document relied on by the prosecutors of Dreyfus, was acquitted by a court-martial. Two days later M. Zola, the eminent novelist, in a letter headed *J'accuse* published in the *Aurore*, made serious charges against the general staff and the Government in connection with the Esterhazy court-martial. He was prosecuted, and condemned to pay a heavy fine and undergo a term of imprisonment.

In June, 1898, M. Brisson succeeded M. Méline as Prime Minister, and next month M. Cavaignac, his War Minister, read to the Chamber several documents which he regarded as conclusive proof of the guilt of Dreyfus. The chief of these was soon admitted by Colonel Henry to have been forged by him, and M. Cavaignac at once resigned. In June, 1899, the Cour de Cassation ordered a fresh court-martial. The court-martial, which sat at Rennes, found Dreyfus guilty with extenuating circumstances. He was sentenced to ten years' imprisonment, but was pardoned by President Loubet almost immediately. In 1906, when Clemenceau was Prime Minister, the sentence was annulled, and Dreyfus was reinstated in the army (as major).

He was shot at by a reactionary journalist in 1908, but escaped without serious injury. In Sept., 1919, Lieutenant-Colonel Dreyfus was publicly presented with the insignia of an officer of the Legion of Honour. Several times during the progress of the case France seemed on the verge of revolution.—Cf. J. Reinach, *Histoire de l'affaire Dreyfus*.

DRIFFELD, GREAT. A town, England, Yorkshire, at the head of a navigable canal communicating with the Humber at Hull. It lies in a fertile district, has an ancient church, and manufactures linseed-cake and manures. Pop. (1931), 5916.

DRIFT. In geology, a term applied to earth and rocks which have been conveyed by flood-action, glaciers, or floating ice and deposited over the surface of a country. It is sometimes



1. Combined hand and bench drill. 2, Pneumatic drill. 3, Portable drill

used in a wider sense to denote all post-Pliocene sands, gravels and clays, such as the superficial depsoits shown on the "drift" maps of the Geological Survey.

DRIFT. In mining, a horizontal tunnel or passage excavated underground that follows the course of a vein or stratum. Drift, in musketry, is the lateral deviation of the bullet after it has left the barrel of the rifle; it is due to the spin of the bullet and the resistance of the air.

DRIFTER. Small vessel engaged in fishing with the aid of drift nets. Normally about 100 feet long, they are much used in the herring fisheries. During the Great War hundreds of them were engaged in patrolling the narrow seas, maintaining barrages and netting channels for submarines. On the Dover Patrol 256 drifters and trawlers did constant duty.

Drift nets are fastened to drifters and moved through the waters to catch herring, mackerel and other fish that are found in shoals. Cork keeps them in position at the top and weights at the bottom. Some are 120 yards long.

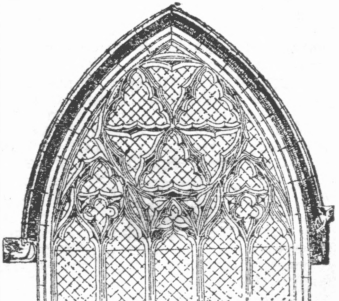
DRIFT SAND. Sand thrown up by the waves of the sea, and blown when dry some distance inland until arrested by obstacles, round which it gradually accumulates until the heaps attain considerable dimensions, often forming dunes or sand-hills. Coast-land sometimes requires artificial protection from encroachment by drift-sand.

DRILL. A tool used for boring holes in wood, metal, stone, ivory, etc. It consists of a sharp spindle to which a circular motion is communicated by various contrivances. Drills are of various designs. For rock-boring the diamond rock-drill, an instrument with cutting edges made of bort or black diamond, is now generally adopted. *See* BORING. —Cf. Dana and Saunders, *Rock Drilling*.

DRILL (*Papio leucophæus*). A large variety of baboon, smaller and less fierce than the mandrill, and like it a native of the coast of Guinea. The face and ears are bare and of a glossy black colour, the palms of the hands and soles of the feet are also naked and of a deep copper colour.

DRINKWATER, John (1882-). English poet, dramatist and critic, was co-founder of The Pilgrim Players, now The Birmingham Repertory Theatre. His first volume of poems appeared in 1906, and his *Collected Poems* in 1923. His plays include *Cophetua* (1911), *Abraham Lincoln* (1918), *Oliver Cromwell*, *Mary Stuart* (1921), *Robert E. Lee* (1923), *Bird-in-Hand* (1928). His most important prose work, *The Pilgrim of Eternity*, appeared in 1925. He has written also critical studies on Morris and Swinburne, and in 1930 he published a book on *Pepys*.

DRIPSTONE. A projecting tablet or moulding over the head of a Gothic doorway, window, archway, or niche to throw off the rain. It is also called a *weather moulding*, and *label* when it is turned square. It is of various forms; sometimes a head is used as a termination or support, in others an ornament or simple moulding is adopted.



Dripstone, over window, decorated Gothic

DROGHEDA (droh'e-da). An ancient town and seaport, formerly a parliamentary borough, Irish Free State, in Louth, on both sides of the Boyne, about 4 miles from the sea, 26 miles north of Dublin. The Boyne is here crossed by a railway viaduct of 18 arches and 95 feet high. Flax and cotton-spinning are carried on; there are also salt-works, breweries, and tanneries; and the fisheries are increasing. There is a good export trade in cattle, sheep, grain, butter, and eggs. In 1412 a Parliament assembled here which enacted Poynings' Law. The town was for a long time strongly fortified, and was taken by Cromwell with great slaughter in 1649; it surrendered to William III. immediately after the battle of the Boyne. Pop. (1926), 12,688.

DROHOBYCZ (dro'ho-bich). A Polish town in Galicia, formerly belonging to Austria, 41 miles S.S.W. of Lemberg. Its Catholic church is one of the handsomest in the country. It has an important trade, particularly in salt, obtained from springs in the vicinity. Pop. 27,000.

DROITWICH (droit'ich). A town of England, in the county and 7 miles N.N.E. of Worcester, on the Salwarp. It is famous for its brine springs, from which salt has been manufactured for more than 1000 years. Pop. (1931), 4553.

DRÔME. A south-east department of France, covered almost throughout by ramifications of the Alps, the average height of which, however, does not exceed 4000 feet; area, 2532 sq. miles, of which about one-fourth is waste, one-third under wood, and a great part of the remainder under tillage and pasture. A considerable extent of the area is occupied by vineyards, and several of the wines produced have a high reputation, especially Hermitage. Olives, chestnuts, and silks are staple productions. Valence is the capital. Pop. (1931), 267,080.

DROMEDARY. *See* CAMEL.

DROMORE'. An episcopal city, Northern Ireland, County Down, on the Lagan, 16 miles from Belfast. Its cathedral contains the tomb of Jeremy Taylor. Pop. (1926), 2229.

DRONE. Name for the male of the honey bee. In size it is intermediate between the workers and the queen bee. It does not work and is stingless. At the beginning of autumn the workers turn out all the drones from the hive.

DROPSY (Œdema). Is a condition usually marked by enlargement and swelling of the affected parts, and due to an accumulation of serous fluid in the tissue spaces and cavities of the body. Different names are given to such accumulations in particular areas, thus *anasarca* refers to accumulations in the limbs and body generally; *ascites* to an accumulation of fluid in the peritoneal cavity (abdomen); *hydrothorax* to an accumulation in the pleural cavity (lungs); *hydrocephalus* to an accumulation in the brain. The commonest cause of dropsy is heart disease, where first the lower limbs, and then the trunk, are affected. It also appears in diseases of the kidneys and liver, and it may be produced in a limb by any obstruction of the veins of the part.

DROP-WORT (from the small tubers on the fibrous roots). *Spiræa filipendula*, nat. ord. Rosaceæ, a British plant of the same genus as queen-of-the-meadow, found in dry pastures. The hemlock drop-wort, or water drop-wort, is *Œnanthe fistulosa*.

DROSERA'CEÆ. A nat. ord. of polypetalous Dicotyledons, consisting of insectivorous marsh herbs, whose leaves are usually covered with glands or glandular hairs. It contains six genera, including the sundew (Drosera), and Venus's fly-trap (Dionæa). (*See* SUNDEW and DIONÆA.) They have no known qualities except that they are slightly bitter. The leaves are generally circinate in the bud, as in ferns.

DROSHKY. A kind of light, four-wheeled carriage used by the Russians. It is not covered, and in some types there is in the middle a sort of bench placed lengthways on which the passengers ride as on a saddle; but the name is now applied to various kinds of vehicles, as to the common cabs plying in the streets of German cities.

DROUAIS (drö-ā), **Jean Germain.** French historical painter of considerable repute, born at Paris in 1763, died at Rome, 1788. His best pictures are: *The Canaanitish Woman at the Feet of Jesus, Dying Gladiator*, and *Marius at Minturno*.

DROUET (drö-ā), **Jean Baptiste, Comte d'Erlon.** French general, born 1765, died 1844. He served in the campaigns of the Moselle, Meuse, and Sambre (1793-6), in the Peninsula, and at Waterloo, where he commanded the first *corps d'armée*. In 1834-5 he was Governor-General of Algeria, and in 1843 was made a marshal.

DROYLSDEN. A town of England, Lancashire, 4½ miles E. of Manchester, of which it is practically a suburb. Pop. (1931), 13,277.

DRUGGET. A coarse kind of woollen felt or cloth, formerly used by the lower classes for purposes of clothing, but now chiefly used as a covering for carpets.

DRUIDS. The priests of the Celts of Gaul and Britain. According to Julius Cæsar they possessed the greatest authority among the Celtic nations. They had some knowledge of geometry, natural philosophy, etc., superintended the affairs of religion and morality, and performed the office of judges. They were also well versed in the knowledge of the mysterious powers of plants and animals, and were adepts in the magic arts. They venerated the mistletoe when growing on the oak, a tree which they likewise esteemed sacred. They had a common superior,

A Druid

who was elected by a majority of votes from their own number, and who was appointed for life. They took unusual care to fence themselves round with mysteries, and it is probable that they cherished doctrines unknown to the common people; but that they had a great secret philosophy which was handed down by oral tradition is very unlikely. Of their religious doctrines little is known.—BIBLIOGRAPHY: J. Rhys, *Lectures on the Origin and Growth of Religion as Illustrated by Celtic Heathenism*; D'Arbois de Jubainville, *Les Druides et les dieux celtiques à forme d'animaux*.

DRUIDS, Order of. A secret organization, founded in London in 1781, for the purpose of mutual aid and protection. Their rites somewhat resemble those of freemasons; their lodges are known as "groves."

DRUM. A musical instrument of percussion, of Eastern origin, either cylindrical or hemispherical in shape, with the end or ends covered with tightened parchment, which is stretched or slackened at pleasure by means of cords with sliding knots or screws. Drums are of three kinds: (1) the long or bass drum played with stuffed-nob drumsticks, and used only in large orchestras or military bands; (2) the side-drum, having two heads, the upper one only being played upon by two sticks of wood; (3) the kettle-drum, a hemisphere of brass or copper, the end of which is covered with parchment, always used in pairs, one drum being tuned to the key-note, and the other to the fifth of the key, the compass of the two together being an octave. The use of drums was introduced into Europe either by the Moors or the Crusaders.

DRUMCLOG'. A moorland tract in Lanarkshire, Scotland, 6 miles S.W. of Strathaven, the scene of a skirmish between Claverhouse and the Covenanters, in which the former was defeated (1679). A graphic description of the battle is given by Scott in his *Old Mortality*.

DRUM-FISH, or **DRUM.** *Pogonias chromis*, and other species of the same genus, fishes found on the Atlantic coast of N. America, and so named from the deep drumming sound they make, by means of the swim-bladder and its muscles, during the spawning season in April. It is the most powerful sound-producing apparatus known among fishes. They often weigh about 20 lb.

DRUM-MAJOR. In the British army, a warrant or non-commissioned officer whose duty it is to teach and direct the drummers. He marches at the head of the band carrying the regimental baton.

DRUM'MOND, Professor Henry. Was born at Stirling in 1851, died in 1897. Educated at the Universities of Edinburgh and Tübingen, he entered the ministry of the Free Church, and having devoted much attention to science, in 1877 was appointed lecturer on natural science in the Free Church College (or divinity hall), Glasgow, becoming professor in 1884. He travelled much, and wrote a popular book on *Tropical Africa* (1888). His most remarkable work is *Natural Law in the Spiritual World* (1883), which has passed through many editions and been translated into various languages. He is author, also, of *Travel Sketches in Our New Protectorate*, *The Greatest Thing in the World*, and *The Ascent of Man* (1894).

DRUMMOND, Rev. James. Unitarian theologian, was born at Dublin in 1835, died 13th June, 1918. After receiving his early education at a private school, he entered Trinity

College, Dublin, where he graduated and obtained the first gold medal for classics in 1855. In 1859 he became colleague of the Rev. W. Gaskell in Cross Street Chapel, Manchester, and ten years later was appointed professor of theology at Manchester New College, London, of which institution (now known, since its removal to Oxford in 1889, simply as Manchester College) he was principal from 1885 to 1906, when he retired from his post.

DRUMMOND, William. Of Hawthornden, a Scottish poet distinguished for the elegance and tenderness of his verses, was born at Hawthornden House, 7 miles from Edinburgh, 1585, died 1649. He was educated at the University of Edinburgh; after which he spent four years in foreign travels, residing for a part of the time at Bourges, to study the civil law. On his return to Scotland he retired to Hawthornden and gave himself up to the cultivation of poetry and polite literature, and here he spent the most of his life.

He entertained Ben Jonson on the occasion of a visit which the English dramatist made to Scotland in the winter of 1618-9, and took notes of Jonson's conversation, first published in entirety in 1842 (*Notes of Ben Jonson's Conversations with William Drummond*). He was the first Scottish writer to abandon the native dialect for the language raised to supremacy by the Elizabethan writers.

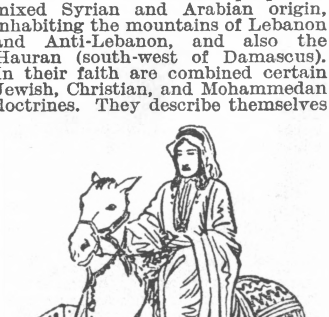
His chief productions are: *The Cypress Grove*, in prose, containing reflections upon death; *Flowers of Zion, or Spiritual Poems*; *Tears on the Death of Mœliades* (that is, Prince Henry); *Poems, Amorous, Funeral, Divine, Pastoral, in Sonnets, Songs, Sextains, Madrigals*; *The River Forth Feasting* (on King James's visit to Scotland in 1617); *Polemo-Middinia, or the Battle of the Dunghill: a Macaronic Poem*; and *History of the Lives and Reigns of the Five Jameses, Kings of Scotland*. As an historian he is chiefly remarkable for an ornate style, and a strong attachment to the High Church principles of the Jacobites.

DRUNKEN PARLIAMENT. In Scottish history, a name given to the Privy Council who, under their powers as representing the estates between sessions, met at Glasgow and passed an Act (1st Oct., 1662) to remove the recusant ministers from their parishes within a month. All the members were said to have been drunk except Lockhart of Lee, who opposed the measure.

DRUPE. In botany, a stone fruit; a fruit in which the outer part of the pericarp becomes fleshy or softens like a berry while the inner hardens like a nut, forming a stone with a kernel, as the plum, cherry, apricot, and peach. The stone enclosing the kernel is called the *endocarp*, while the pulpy or succulent part is called the *mesocarp*. In some fruits, as those of the almond, the horse-chestnut, and coconut, the mesocarp is not succulent, yet, from their possessing the other qualities of the drupe, they receive the name. *See* BERRY.

DRURY LANE THEATRE. One of the principal theatres in London, was established by Thomas Killigrew in the reign of James I. In 1671 it was burned down, and was rebuilt by Sir Christopher Wren between 1672 and 1674, but again destroyed by fire in 1809. On this occasion it was rebuilt by B. Wyatt, and was reopened on 10th Oct., 1812, with an address composed by Lord Byron. It was in connection with this opening that James and Horace Smith wrote the *Rejected Addresses*. Nearly all the great English actors from Betterton and Garrick have been more or less connected with Drury Lane.—Cf. J. Doran, *In and About Drury Lane*.

DRUSES. A curious people of mixed Syrian and Arabian origin, inhabiting the mountains of Lebanon and Anti-Lebanon, and also the Hauran (south-west of Damascus). In their faith are combined certain Jewish, Christian, and Mohammedan doctrines. They describe themselves



Druse

as followers of Hhalif Hakim Biamr-Allah, whom they regard as an incarnation of deity, the last prophet, and the founder of the true religion. They are nearly all taught to read and write. They maintain a semi-independence, and between 1840 and 1860 they engaged in bloody conflicts with their neighbours the

Maronites. Their total number is estimated at 100,000. They are very friendly to the English, and some of them have been converted to Christianity. *See* SYRIA and LEBANON.

DRUSILLA, Livia. Roman lady. The wife of Tiberius Claudius Nero, by him she had a son, Tiberius, the future emperor and another son, Nero Claudius Drusus. She then became the wife of Augustus, who made her husband divorce her. Their union was childless, but Drusilla retained his affection until his death. For some time after Tiberius became emperor, she had very great influence, but they soon quarrelled. She died in A.D. 29.

DRUSUS. The name of several distinguished Romans, among whom were: **Marcus Livius,** orator and politician; became tribune of the people in 122 B.C. He opposed the policy of Gaius Gracchus, and became popular by planting colonies.—**Marcus Livius,** son of the above, was early a strong champion of the senate or aristocratic party, but showed great skill in manipulating the mob. He rose to be tribune of the people, and was assassinated 91 B.C.—**Nero Claudius,** brother of the Emperor Tiberius, born 38 B.C. By a series of brilliant campaigns he extended the Roman Empire to the German Ocean and the River Elbe, and was hence called **Germanicus.** By his wife, Antonia, daughter of Mark Antony, he had a daughter, Livia, and two sons, Germanicus and Claudius, the latter of whom afterwards became emperor. He died in 9 B.C.

DRY'ADS. Wood nymphs, in the Greek mythology; supposed to be the tutelar deities of trees. Each particular tree or wood was the habitation of its own special dryad.

DRYAS. *See* MOUNTAIN AVENS.

DRY'BURGH ABBEY. A monastic ruin in Scotland, consisting of the nave's western gable, the gable of the south transept, and a fragment of choir and north transept of an abbey founded in 1150 on the banks of the Tweed, about 5 miles E.S.E. of Melrose. It is celebrated as the burial-place of Sir Walter Scott and his family. His son-in-law, Lockhart, and Earl Haig are also buried there.

DRY CELL. Originally a cell of the Leclanché type, in which the solution of sal-ammoniac was replaced by a paste containing this substance. The formulæ or recipes from which dry cells are now made up are numerous, although the electrodes, as a rule, remain the same as in the Leclanché cell. The E.M.F. of the cell is about 1.5 volts, and three dry cells are used to light up a small "flash" lamp. A battery of dry cells forms a convenient and portable means of supplying a small current at voltages up to 100.

DRY'DEN, John. English poet, was descended from an ancient family, his grandfather being Sir Erasmus Dryden of Canons Ashby, Northamptonshire. Born near Aldwinkle, Northamptonshire, in 1631, he was admitted a King's scholar at Westminster under the celebrated Dr. Busby, whence he went to Trinity College, Cambridge, being elected to a scholarship there. After leaving the university, he went to London, where he acted as secretary to his cousin Sir Gilbert Pickering, a favourite of Cromwell; and on the death of the Protector he wrote his *Heroic Stanzas* on that event. At the Restoration, however, he hailed the return of Charles II. in *Astræa Redux*, and from that time his devotion to the Stuarts knew no decay.

In 1661 he produced his first play, *The Duke of Guise*; but the first that was performed was *The Wild Gallant*, which appeared in 1663 and was not a success. This was followed by *The Rival Ladies* and *The Indian Queen*, a tragedy on Montezuma in heroic verse, written in collaboration with Sir Robert Howard, whose sister, Lady Elizabeth Howard, Dryden married in 1663. He followed up *The Indian Queen* with *The Indian Emperor*, which at once raised Dryden to the highest pitch of public estimation, an elevation which he retained till his death. The great fire of London put a stop for some time to theatrical exhibitions.

In the interval Dryden published the *Annus Mirabilis*, an historical account of the events of the year 1666, one of the most elaborate of his productions. In 1668 he also published his celebrated *Essay on Dramatic Poesy*—the first attempt to regulate dramatic writing. In 1668 *The Maiden Queen*, a tragi-comedy was represented. This was followed in 1670 by *The Tempest*, an alteration from Shakespeare, in which he was assisted by Sir William Davenant. It was received with general applause, notwithstanding the very questionable taste and propriety of the added characters. Dryden was shortly afterwards appointed to the offices of Historiographer Royal and Poet Laureate, with a salary of £200 a year.

He now became professionally a writer for the stage, and produced many pieces, some of which have been strongly censured for their licentiousness and want of good taste. The

first of his political and poetical satires, *Absalom and Achitophel* (Monmouth and Shaftesbury), was produced in 1681, and was followed by *The Medal*, a satire against sedition and *Mac Flecknoe*, a satire on the poet Shadwell. In 1682 he published a poem called *Religio Laici*, wherein he maintained the doctrines of the Church of England.

On the accession of James in 1685 Dryden became a Roman Catholic, a conversion the sincerity of which has been not unreasonably regarded with suspicion, considering the time at which it occurred. At court the new convert was received with open arms, a considerable addition was made to his pension, and he defended his new religion at the expense of the old one in a poem, *The Hind and the Panther*. Among his other services to the new king were a savage reply to an attack by Stillingfleet, and panegyrics on Charles and James under the title of *Britannia Rediviva*. At the Revolution Dryden was deprived of the offices of Poet Laureate and Historiographer, and of the certain income which these offices secured him.

During the remaining ten years of his life he produced some of his best work, including his admirable translations from the classics. He published, in conjunction with Congreve, Creech, and others, a translation of Juvenal, and one of Persius entirely by himself. About a third part of Juvenal was translated by Dryden, who wrote an essay on satire which was prefixed to the whole. His poetic translation of Virgil appeared in 1697, and, soon after, the well-known lyric, *Alexander's Feast*, and his *Fables*. He died 1st May, 1700, in the sixty-ninth year of his age, and was buried in Westminster Abbey.

Dryden is unequalled as a satirist among English poets, and the best of his tragedies are unsurpassed by any since written. His poetry as a whole is more remarkable for vigour and energy than beauty, but he did much to improve English verse. He was also an admirable prose writer. Personally he was modest and kindly. The whole of his works, edited by Sir W. Scott, were published in 1818 (18 vols. 8vo); they were republished with additional notes, etc., by Professor Saintsbury (1882-93).—BIBLIOGRAPHY: R. Garnett, *Age of Dryden*; Sir A. W. Ward, *History of English Dramatic Literature*; *Cambridge History of English Literature* (vol. viii.).

DRY FARMING. Method of farming adopted in some parts of the United States, South Africa and other countries where the rainfall is inadequate. It consists essentially of the conservation of rain water in the ground by tillage, thus keeping the soil loose and thereby checking evaporation. Part of the land may be in cultivation, while the rest is kept in a loose condition to retain moisture for the following year's crop. This method is adopted for growing hard or macaroni wheats in America.

DRYING-OILS. Linseed and other oils, which are the bases of many paints and varnishes. When exposed to the air, they absorb oxygen, and are converted into a transparent, tough, dry mass or varnish.

DRY-POINT. A method of engraving generally regarded as part of etching, but more closely allied to line engraving. Instead of the copper being covered with etching ground and the lines bitten with acid, a pointed instrument is drawn across it, which incises a fine line with a more distinct burr on each side than that raised by a graver. This burr helps to give a characteristic quality to the line, but is rapidly worn away by printings. Dry-point may be used by itself, but is frequently combined with etching proper.

DRY-ROT. A well-known disease affecting timber, occasioned by various species of Fungi, the mycelium of which penetrates the timber, destroying it. *Merulius lacrymans*, which is found chiefly in fir-wood, is the most common and most formidable dry-rot fungus in Britain; while *Polyporus destructor* is equally destructive in Germany. *P. vaporarius* may also cause dry-rot. Damp, unventilated situations are most favourable to the development of dry-rot Fungi. Various methods have been proposed for the prevention of dry-rot; that most in favour is thoroughly saturating the wood with creosote, which makes the wood unfit for vegetation, but proper ventilation is the surest safeguard.

DU'ALISM. The philosophical exposition of the nature of things by the hypothesis of two dissimilar primitive principles not derived from each other. Dualism in religion is chiefly confined to the adoption of a belief in two fundamental beings, a good and an evil one, as is done in some Oriental religions, especially that of Zoroaster. In metaphysics, dualism is the doctrine of those who maintain the existence of matter and form, or mind and matter, as distinct substances, in opposition to idealism, which maintains that we have no knowledge or assurance of the existence of anything but our own ideas or sensations.

Dualism may correspond with realism in maintaining that our ideas of things are true transcripts of the originals, or rather of the qualities inherent in them, the spirit acting as a mirror and reflecting their true images; or it may hold that, although produced by outward objects, we have no assurance that in reality these at all correspond to our ideas of them, or even that they produce the same idea in two different minds. Among modern philosophers Professor W. M'Dougall and Bergson have defended the doctrine of dualism. *See* MONISM.—BIBLIOGRAPHY: J. Ward, *The Realm of Ends*; W. James, *Essays in Radical Empiricism*; H. Bergson, *Matter and Memory*.

DU BARRY, Marie Jeanne Bécu, Comtesse. Mistress of Louis XV., was born at Vaucouleurs in 1743. She came young to Paris, and was presented to the king in 1769, who had her married for form's sake to the Comte du Barry. She exercised a powerful influence at court, and with some of her confidants completely ruled the king. Important offices and privileges were in her gift, and the courtiers abased themselves before her. After the death of Louis she was dismissed from court and sent to live in a convent near Meaux. She received a pension from Louis XVI. During the reign of terror she was arrested as a Royalist and executed, Nov., 1793. —Cf. N. Williams, *Madame du Barry*.

DUBIT'ZA. A fortified town of Bosnia, in Yugoslavia, on the right bank of the Unna, about 10 miles from its confluence with the Save. In the sixteenth and seventeenth centuries it was a frequent point of contention between Austria and Turkey. In 1878, with the rest of Bosnia, it passed under Austrian administration. Pop. 3260.—**Dubitza,** in Croatia, on the opposite bank of the Unna, has 6660 inhabitants.

DUB'LIN. The chief city of the Irish Free State, in County Dublin, on the east coast of the island, at the mouth of the Liffey, the banks of which for more than 2 miles from the sea are lined with quays. The Local Government (Dublin) Act, 1930, constituted the City of Dublin, which includes the old County Borough of Dublin. The river, which divides the city into two unequal parts, is crossed by numerous bridges. In the old part of the city the streets are irregular, narrow, and filthy; in the more modern and aristocratic quarters there are fine streets, squares, and terraces, but with little pretension to architectural merit.

Buildings. The public buildings, however, are especially numerous and handsome. The main thoroughfare, east to west, is by the magnificent quays along the Liffey. The principal street at right angles to the river is Sackville Street, a splendid street 650 yards long and 40 yards wide, forming a thoroughfare which is continued across the river by O'Connell Bridge, a magnificent structure the same width as Sackville Street. The principal public secular buildings are the castle, the official residence of the viceroy; the Bank of Ireland, formerly the Irish Parliament House; Trinity College; the custom-house; the King's Inns; the post office; rotunda; corn exchange; commercial buildings; the mansion house; and the city hall or corporation buildings.

The most important literary and scientific institutions are Trinity College (Dublin University); the National University of Ireland; the Royal College of Science; the Catholic University; the College of Surgeons; the Royal Dublin Society; the Royal Hibernian Academy of Painting, Sculpture, and Architecture; the Royal Irish Academy for Promoting the Study of Science, Literature and Antiquities; the Archæological Society; and the Royal Zoological Society.

Dublin contains two Protestant Espicopal cathedrals—St. Patrick's Cathedral, erected in 1190, and thoroughly restored between 1860 and 1865, through the munificence of Sir Benjamin Lee Guinness; and Christ's Church, built in 1038 and restored between 1870 and 1877, the restoration being carried out at the expense of Henry Roe. The Roman Catholic Cathedral is a very large edifice. The charitable institutions are numerous, and some of them possess splendid buildings. There are several extensive military and constabulary barracks in the city and vicinity. A little north-west of the city, up the Liffey, is the Phœnix Park, with an area of 1759 acres. In it are the Viceregal Lodge, the usual residence of the King's representative; the Chief Secretary's and Under-Secretary's official residences; the Royal Hibernian Military School; and the depot of the Royal Irish Constabulary; as also the gardens of the Royal Zoological Society.

Manufactures. The manufactures carried on are of little note: poplins, for which Dublin has been long celebrated, are still in some request, and brewing and distilling are largely carried on. Indeed, Dublin to an enormous extent is reliant on the well-known firm of Guinness. To-

bacco manufacture is now an important industry. Serious Sinn Fein risings occurred in Dublin at Easter, 1916, in 1919, and 1920, and there were also disorders in May, 1921. Many fine buildings were completely destroyed during those troubles. Dublin is an ancient town, but its early history is obscure. It was held by the Danes for more than three centuries from 836. Pop. 405,126.—The county, which is in the province of Leinster, on the east coast of the island, has an area of 219,344 acres, about a third of it under crops of various kinds, chiefly grass and clover. The surface on the whole is flat, but the ground rises at its southern boundary into a range of hills, the highest of which—Kippure—is 2473 feet above the sea. There is about 70 miles of sea-coast, the chief indentation being Dublin Bay. The principal stream is the Liffey, which intersects the county west to east. Important water communications are the Royal and the Grand Canals, both centring in Dublin, and uniting the Liffey with the Shannon. The manufactures are unimportant, but the fisheries are extensive. Population (1926), 188,961; Dublin (county borough), 316,693.—Cf. D. A. Chart, *The Story of Dublin*.

DUBNO. A town of the Ukraine, government of Volhynia. It was a place of some importance before the annexation of Western Poland by Russia. During the European War it was recaptured in the Russian advance in June, 1916. Pop. 14,000.

DUBOIS (dü-bwä), **Guillaume.** A French cardinal, was the son of an apothecary, born in 1656, died 1723. He became tutor to the Duke of Chartres, afterwards Duke of Orleans and Regent, and maintained his influence by pandering to the vices of his pupil. He became Privy Councillor and overseer of the duke's household, and Minister for Foreign Affairs under the regency.

The archbishopric of Cambrai having become vacant, Dubois ventured to request it of the regent, although he was not even a priest. The regent was astonished at his boldness; but he obtained the post, having in one morning received all the clerical orders, and, a few days after, the archbishopric. By his consummate address he obtained a cardinal's hat, and in 1721 was appointed Prime Minister.

DUBOIS (dü-bwä), **Paul.** French sculptor, born 1829, died in 1905. He first studied law, but from 1856 to 1858 gave himself up to sculpture under Toussaint at Paris, and then went to Italy, where the sculptors of the early Renaissance, Donatello and Luca Della Robbia, had a decided influence upon him.

Among his works are a *St. John*, a *Narcissus*, a *Madonna and Child*, *Eve Awakening to Life*, a figure of *Song* for the opera-house at Paris, and numerous busts; but his greatest work is the monument of General Lamoricière in the Cathedral of Nantes, with figures of *Military Courage*, *Charity*, *Faith*, and *Meditation*, which rank among the best products of French plastic art. He is also distinguished as a painter of portraits. He was director of the École des Beaux Arts from 1878 until his death, and received the grand cross of the Legion of Honour.

DU BOIS-REYMOND (dü bwä-rā-mōn), **Emil.** German physiologist, and an especial authority on animal electricity, born at Berlin, 1818, died in 1896. He studied theology, geology, and afterwards anatomy and physiology, and became professor of physiology in the University of Berlin in 1858. His principal publication is *Researches in Animal Electricity*.

DUBOV'KA. A town of South Russia, government of Saratov, on the Volga; it has an extensive river trade in wool, iron, oil, and grain. Pop. 17,000.

DUBUQUE (du-būk'). A city of Iowa, United States, on the right bank of the Mississippi. It occupies an important commercial position as a railway centre and entrepôt for the agricultural and mineral products of the northern half of Iowa, and the timber of Wisconsin, and also from the valuable lead-mines in its vicinity. Pop. 41,679.

DUC'AT (Lat. *ducātus*, a duchy). A coin formerly common in several European states. They were either of silver or gold; value of the former, 3*s.* to 4*s.*, of the latter about 9*s.* 4*d.* They were named from being first coined in one of the Italian duchies.

DUCATOON'. Formerly a Dutch silver coin worth 3 gulden 3 stivers, or 5*s.* 3*d.* sterling. There were coins of the same name in Italy. In Tuscany its value was about 5*s.* 5*d.*, in Savoy slightly more, and in Venice about 4*s.* 9*d.*

DU CHAILLU (dü-shā-yü), **Paul Belloni.** Traveller, born in Paris, 1835, died 1903. He spent his youth in the French settlement at the Gaboon, on the west coast of Africa, where his father was a merchant. In 1852 he went to the United States, of which he afterwards became a naturalized citizen. In 1855 he began his first journey through Western Africa,

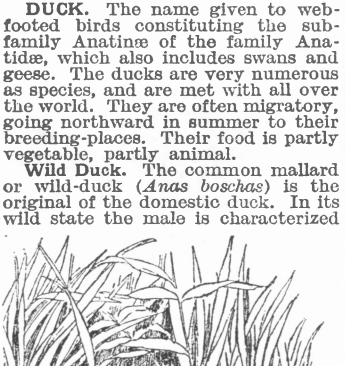
and stayed till 1859 alone among the different tribes, travelling on foot upwards of 8000 miles. He collected several gorillas, never before hunted, and rarely, if ever, before seen by any European.

An account of this journey, *Explorations and Adventures in Equatorial Africa*, was published in 1861. A second expedition was made in 1863, an account of which, under the title, *A Journey to Ashango Land*, appeared in 1867. *The Land of the Midnight Sun*, an account of a tour in Northern Europe (1881), had a considerable success. He published a number of books intended for boys, and based on his travels. One of his works is *The Viking Age* (1889), on the ancestors of the English-speaking peoples.

DUCHESNE, or **DU CHESNE** (dû-shān), **André.** French historian, born in 1584, died in 1640. His most important works are his collection of French historians—*Historiæ Francorum Scriptores*; *Historiæ Normanorum Scriptores* 838-1220; *Histoire d'Angleterre, d'Écosse, et d'Irlande*; *Histoire des Papes.*

DUCK. The name given to web-footed birds constituting the sub-family Anatinæ of the family Anatidæ, which also includes swans and geese. The ducks are very numerous as species, and are met with all over the world. They are often migratory, going northward in summer to their breeding-places. Their food is partly vegetable, partly animal.

Wild Duck. The common mallard or wild-duck (*Anas boschas*) is the original of the domestic duck. In its wild state the male is characterized by the deep green of the plumage of the head and neck, by a white collar separating the green from the dark chestnut of the lower part of the neck, and by having the four middle feathers of the tail recurved. The wild-duck is taken in large quantities by decoys and other means.



Mallard, or Wild Duck

Tame Duck. Some tame ducks have nearly the same plumage as the wild ones; others vary greatly, being generally duller or pure white, but all the males have the four recurved tail-feathers. There are several favourite varieties of the domestic duck, those of Normandy and Picardy in France, and the Aylesbury ducks in England, being remarkable for their great size and delicacy of flesh.

Other species of the sub-family are: shoveller (*Spatula clypeata*), garganey (*Querquedula circia*), pintail or sea-pheasant (*Dafila acuta*), teal (*Nettion crecca*), widgeon (*Mareca penelope*), gadwall (*Chaulelasmus streperus*), sheldrake (*Tadorna cornuta*), tree-ducks (species of Dendrocygna).

DUCKING-STOOL. A stool or chair in which common scolds were formerly tied and plunged into water. They were of different forms, but that most commonly in use consisted of an upright post and a transverse movable beam on which the seat was fitted or from which it was suspended by a chain. The ducking-stool is mentioned in *Domesday Book* (Chester): it was extensively in use throughout the country from the fifteenth till the beginning of the eighteenth century, and in one case —at Leominster—was used as late as 1809.

DUCKWEED. The popular name of several species of Lemna, nat. ord. Lemnaceæ, plants growing in ditches and shallow water, floating on the surface, and serving as food for ducks and geese. Five species are known in Britain, and others are common in America. They consist of small fronds bearing naked unisexual flowers.

DUCKWORTH, Sir John Thomas. A British admiral, born in 1748, died 1817. He joined the navy when eleven years of age; and was post-captain in 1780. In 1793, on the breaking out of the French war, he was appointed to the command of the *Orion*, 74, forming part of the Channel fleet under Lord Howe, and distinguished himself in 1794 in the great naval victory on 1st June. In 1798 he aided in the capture of Minorca. From 1800 to 1806 he rendered important services on the West India station, in particular gaining a complete victory over a French squadron, for which he re-

ceived a pension of £1000 a year and the thanks of both Houses of Parliament. In 1807, having been ordered to Constantinople, he forced the passage of the Dardanelles, but suffered severely from the Turkish batteries in returning. From 1810 to 1814 he commanded the Newfoundland fleet, and in 1817 he was appointed to the chief command at Plymouth. In 1813 he was created a baronet.

DUCTIL'ITY. The property of solid bodies, particularly metals, which renders them capable of being extended by drawing, while their thickness or diameter is diminished, without any actual fracture or separation of their parts. The following is nearly the order of ductility of the metals which possess the property in the highest degree, that of the first mentioned being the greatest: gold, silver, platinum, iron, copper, nickel, palladium, cadmium, zinc, tin, lead. Dr. Wollaston succeeded in obtaining a wire of platinum only 1/30000th of an inch in diameter. The ductility of glass at high temperatures seems to be unlimited, while its flexibility increases in proportion to the fineness to which its threads are drawn.

DUDDON. An English river which flows 20 miles along the boundaries of Cumberland and Lancashire to the Irish Sea, and is the subject of a series of sonnets by Wordsworth, written in 1820.

DU DEFFAND, Madame. *See* DEFFAND.

DUDERSTADT (dö'dĕr-stât). An old German town, province of Hanover, 10 miles east of Göttingen, formerly a member of the Hanseatic League and a place of some importance. Pop. 6500.

DUDEVANT, Madame. *See* SAND, GEORGE.

DUD'LEY, Sir Edmund. Born 1462, executed 1510, noted in English history as an instrument of Henry VII. in the arbitrary acts of extortion by the revival of obsolete statutes and other unjust measures practised during the latter years of his reign. On the accession of Henry VIII. he was arrested for high treason, and perished on the scaffold with his associate, Sir Richard Empson.

DUDLEY, Lord Guildford. Son of John, Duke of Northumberland, was married in 1553 to Lady Jane Grey, whose claim to the throne the duke intended to assert on the death of Edward VI. On the failure of the plot Lord Guildford was condemned to death, but the sentence was not carried into effect till the insurrection of Wyatt induced Mary to order his immediate execution (1554).

DUDLEY, John, Duke of Northumberland. Son of Sir Edmund Dudley, minister of Henry VII., was born in 1502, beheaded 1553. He was left by Henry VIII. one of the executors named in his will, as a kind of joint-regent during the minority of Edward VI. Under that prince he manifested the most insatiable ambition, and obtained vast accessions of honours, power, and emoluments. The illness of the king, over whom he had gained complete ascendency, aroused his fears, and he endeavoured to strengthen his interest by marrying his son, Lord Guildford Dudley, to Lady Jane Grey, descended from the younger sister of Henry VIII., and persuaded Edward to settle the crown on his kinswoman by will, to the exclusion of his two sisters, the Princess Mary and Elizabeth. The attempt to place Lady Jane Grey on the throne failed, and many of the conspirators were executed.

DUDLEY, Robert, Earl of Leicester. *See* LEICESTER.

DUDLEY. A town and municipal borough of England, in an isolated part of Worcestershire enclosed by Staffordshire, 9½ miles west by north of Birmingham. It is situated in the midst of the "black country," and has extensive coal-mines, iron-mines, ironworks, and limestone quarries. It produces nails, chain-cables, anchors, vices, boilers, fire-irons, and has also glassworks, brickworks, and brass-foundries. There are the remains of a castle, said to have been founded in the eighth century by a Saxon prince called Dud, who has given the town its name. Dudley returns one member to Parliament. Pop. (1931), 59,579.

DUDLEY LIMESTONE. A highly fossiliferous limestone belonging to the Silurian system, occurring near Dudley, and equivalent to the Wenlock limestone. It abounds in beautiful masses of coral, shells, and trilobites.

DUEL (Lat. *duellum*, from *duo*, two). A premeditated and prearranged combat between two persons with deadly weapons, for the purpose of deciding some private difference or quarrel. The combat generally takes place in the presence of witnesses called seconds, who make arrangements as to the mode of fighting, place the weapons in the hands of the combatants, and see that the laws they have laid down are carried out.

In England duels were never more numerous than in the reign of George III. Among the principals in the chief duels of this period were Charles

James Fox, Sheridan, Pitt, Canning, Castlereagh, the Duke of York, the Duke of Richmond, and Lord Camelford. The last mentioned was the most notorious duellist of his time, and was himself killed in a duel in 1804. A duel was fought between the Duke of Wellington and Lord Winchelsea in 1829, but the practice was dying out. It lasted longest in the army. By English law fatal duelling is considered murder, no matter how fair the combat may have been, and the seconds are liable to the same penalty as the principals. In 1813 the principal and seconds in a fatal duel were sentenced to death, though afterwards pardoned. An officer in the army having anything to do with a duel renders himself liable to be cashiered.

In France duelling still prevails to a certain extent; but the combats are usually very bloodless and ridiculous affairs. In the German army until 1918 it was common, and was recognized by law. The duels of German students, so often spoken of, seldom cause serious bloodshed.—BIBLIOGRAPHY: Millingen, *History of Duelling*; Steinmetz, *Romance of Duelling*; G. Letainturier-Fradin, *Le duel à travers les âges*; C. A. Thimm, *Bibliography of Fencing and Duelling*; A. Hutton, *The Sword and the Centuries*.

DUEN'NA. The chief lady-in-waiting on the Queen of Spain. In a more general sense, an elderly woman holding a middle station between a governess and companion, appointed to take charge of the young daughters of Spanish and Portuguese families.

DUFF, Sir Mountstuart Elphinstone Grant. Writer on political and other subjects, born in Aberdeenshire in 1829, died in 1906. He was educated at Edinburgh Academy, The Grange, Bishop Wearmouth, and Balliol College, Oxford, was called to the Bar at the Inner Temple in 1854, and in 1857 entered the House of Commons as Liberal member for the Elgin Burghs, which constituency he continued to represent until 1881. He was Under-Secretary for India in W. E. Gladstone's ministry from 1868 to 1874, and Under-Secretary for the Colonies from 1880 to 1881, in which latter year he was appointed Governor of Madras. His Indian administration was most successful, and on his retirement in 1886 he was made a G.C.S.I. He was president of the Royal Geographical Society from 1889 to 1893, and of the Royal Historical Society from 1892 to 1899, and was also a trustee of the British Museum.

Works. His published works include: *Studies in European Politics* (1866); *A Political Survey* (1868); *Elgin Speeches* (1871); *Notes of an Indian Journey* (1876); *Miscellanies, Political and Literary* (1879); *Memoir of Sir H. S. Maine* (1892); *Ernest Renan* (1893); and *Notes from a Diary* (7 vols., 1897-1905).

DUFF'ERIN AND AVA, Frederick Temple Hamilton-Blackwood, Marquess of. British statesman and author. Son of the fourth Baron Dufferin and a granddaughter of R. B. Sheridan, born at Florence 1826, died in 1902. He began his public services in 1855, when he was attached to Earl Russell's mission to Vienna. Subsequently he was sent as Commissioner to Syria in connection with the massacre of the Christians (1860); was Under-Secretary of State for India (1864-6); Under-Secretary for War (1866); Chancellor of the Duchy of Lancaster (1868-72); Governor-General of Canada (1872-78); Ambassador at St. Petersburg (1879-81); at Constantinople (1882); sent to Cairo to settle the affairs of the country after Arabi Pasha's rebellion (1882-3); Viceroy of India (1884-8); Ambassador to Italy (1889-91); to France (1891-96).

He was elected president of the Royal Geographical Society in 1878, and Lord Rector of Glasgow University in 1891. Besides being a noted diplomatist, he was also a popular author. In 1847 he published *Narrative of a Journey from Oxford to Skibbereen during the year of the Irish Famine*; in 1860, *Letters from High Latitudes*; also various pamphlets on Irish questions. In 1888 he was made Marquess of Dufferin and Ava.—Cf. Sir A. Lyall, *Life of the Marquess of Dufferin and Ava*.

DUG'DALE, Sir William. An English antiquary, born in 1605 of a good family in Warwickshire, died 1686. He was made Chester herald in 1664; accompanied Charles I. through the civil war; and after the Restoration received knighthood, and was appointed garter king-at-arms. In concert with Roger Dodsworth he produced an important work on English monasteries entitled *Monasticon Anglicanum*. Among his other works are: *Antiquities of Warwickshire*; *The Baronage or Peerage of England*; *Origines Judiciales, or Historical Memoirs of the English Law, Courts of Justice, etc.*; a *History of St. Paul's Cathedral*; and various minor writings. He also completed and published the second volume of Spelman's *Concilia*.

DU'GONG. A herbivorous mammal, the *Halicŏrē dugong*, belonging

to the ord. Sirenia, which also includes the manatees. It is a native of the Indian and Australian seas; possesses a tapering body ending in a crescent-shaped fin, and is said sometimes to attain a length of 20 feet, though generally it is about 7 or 8 feet in length. The fore-limbs are in the form of flippers; hind-limbs are absent. The skin is thick and smooth, with a few scattered bristles; the colour bluish above and white beneath. Its food consists of marine plants; it yields little or no oil, but is hunted by the Malays for its flesh, which resembles veal, and is tender and palatable. It has been suggested that the appearance of this animal has given rise to the legends of mermaids and mermen.

DUGUAY-TROUIN (dü-gă-trö-aŋ), **René.** A distinguished French seaman, born at St. Malo in 1673, died at Paris 1736. As commander of a privateer he took many prizes from the British between 1690 and 1697. He then entered the royal marine as a captain, and signalized himself so much in the Spanish War that the king granted him letters of nobility, in which it was stated that he had captured more than 300 merchant ships and twenty ships of war. By the capture of Rio de Janeiro (1711) he brought the Crown more than 25,000,000 francs. Under Louis XV. he rendered important services in the Levant and the Mediterranean.

DU GUESCLIN (dü-gă-klaŋ), **Bertrand.** Constable of France, born about 1314, died 1380. Mainly to him must be attributed the expulsion of the English from Normandy, Guienne, and Poitou. He was captured by Chandos at the battle of Auray in 1364, and ransomed for 100,000 francs. While serving in Spain against Peter the Cruel, he was made prisoner by the English Black Prince, but was soon liberated. For his services in Spain he was made Constable of Castile, Count of Trastamare, and Duke of Molinas; and in 1370 he was made Constable of France.

DUIKERBOK. Species of Cephalophus, small South African antelopes with short horns (none in the female), and a tuft of stiff hairs between them.

DUISBURG (dö'is-burh). A flourishing town in Rhenish Prussia, 13 miles north of Düsseldorf. It is an ancient place, believed to be of Roman origin. It early rose to be a free town, and became a member of the Hanseatic League. It possesses a beautiful church of the fifteenth century, and has iron manufactories, engineering works, chemical works, and cotton and woollen mills; and a large trade greatly facilitated by a canal communicating with the Rhine, which is about 2 miles distant. Pop. 421,217.

DUKE (Fr. *duc*, Sp. *duque*, It. *duca*, all from Lat. *dux*, leader, commander). A title belonging originally to a military leader. In Britain it is the highest rank in the peerage. Royal dukes have a special status and precedence. The first hereditary duke in England was the Black Prince, created by his father, Edward III., in 1336. The duchy of Cornwall was bestowed upon him, and was thenceforward attached to the eldest son of the king, who is considered a duke by birth. The duchy of Lancaster was soon after conferred on Edward's third son, John of Gaunt, and hence arose the special privileges which these two duchies still in part retain. A duke in the British peerage, not of royal rank, is styled "your grace," or "my Lord Duke"; his wife is a duchess. (*See* ADDRESS, FORMS OF.)

The coronet consists of a richly-chased gold circle, having on its upper edge eight golden leaves of a conventional type called strawberry leaves; the cap of crimson velvet is closed at the top with a gold tassel, lined with sarsenet, and turned up with ermine. (*See* CORONET).

At various periods and in different continental countries the title duke (*Herzog* in Germany) was given to the actual sovereigns of small states. The titles "grand-duke" and "grand-duchess," "archduke" and "archduchess," were in use also on the European continent, especially in Russia and Austria until 1918. In the Bible the word *dukcs* is used (Gen. xxxvi.) for the *duces* of the *Vulgate*.

DUKERIES. District in the N.W. of Nottinghamshire. It includes the existing part of Sherwood Forest, and covers about 100 sq. miles. It stretches from near Mansfield almost to Worksop. Edwinstone is its centre, and it is crossed by the L.N.E. Rly. Coal mines have been opened in the district, but much of it is still beautiful woodland. The name is due to the fact that at one time four dukes lived here. The Duke of Kingston was at Thoresby, now the residence of Earl Manvers; the Duke of Norfolk was at Worksop; Clumber is still the seat of the Duke of Newcastle; and Welbeck of the Duke of Portland.

DUKINFIELD, or DUCKINFIELD. A municipal borough, England, county Cheshire, separated by the Tame from Ashton-under-Lyne, and mostly within Stalybridge parliamentary bor-

ough. Collieries, cotton-factories, brickworks, and tileworks give employment to the population. Pop. (1931), 19,309.

DULAC, Edmund. French artist. Born at Toulouse in 1882, he studied art in Paris under Laurens, and in 1905 settled in London where he has achieved success by his paintings and skill in illustrating and caricature. His exhibition in 1907 of water colours on subjects from *The Arabian Nights* brought him recognition as an artist of ability. Among the works he has illustrated are Shakespeare's *Tempest*, Andersen's *Fairy Tales*, and books of a similar character.

DULCE (dụsl'sā). A lake of Guatemala, on the east coast, communicating with the Gulf of Honduras by the lakelet el Golfete. It is about 30 miles long by 12 broad, and affords profitable turtle hunting.

DULCIGNO (dul-chēn'yō). A small seaport town, formerly in Albania, now in Montenegro, on the Adriatic, the seat of a Roman Catholic Bishop. It was captured by the Austrians in 1916, and retaken by Italian troops in 1918. Pop. 5000.

DUL'CIMER. One of the most ancient musical instruments, used in almost all parts of the world. The modern instrument consists of a shallow trapezium-shaped box without a top, across which runs a series of wires, tuned by pegs at the sides, and played on by being struck by two cork-headed hammers. It is in much less common use in Europe now

Italian Dulcimer

than it was a century or two ago, and is interesting chiefly as being the prototype of the piano. It is still, however, occasionally to be met with on the Continent at fairs in the country, and in England in the hands of street musicians. It was known in Persia and Arabia under the name of *santir*, and was introduced into Europe by the Crusaders. The Hebrew psaltery is supposed to have been a variety of the dulcimer.

DULCITOL, or **DULCITE.** An alcohol closely allied to the sugars. It is found in Madagascar manna, from which it is extracted by boiling water.

DULI'A (Gr. *douleia*, service, from *doulos*, a slave). An inferior kind of worship or adoration, as that paid to saints and angels in the Roman Catholic Church. The Catholics recognize different degrees of worship. The lowest degree is the *dulia*, which is given to saints and angels. *Hyperdulia* is reserved for the Virgin alone; and *latria* is given to God and to each person of the Trinity.

DULSE. A red sea-weed, the *Rhodymenia palmāta*, used in some parts of Scotland as an edible. It has a reddish-brown, or purple, leathery, veinless frond, several inches long, and is found at low water adhering to the rocks. It is an important plant to the Icelanders, and is stored by them in casks to be eaten with fish. In Kamchatka a fermented liquor is made from it. In the south of England the name is given to the *Iridæa edūlis*, also an edible red sea-weed.

DULUTH (du-lụth'). A town of the United States, capital of St. Louis county, Minnesota, at the south-west extremity of Lake Superior. The Northern Pacific and Lake Superior and Mississippi railways terminate here; and extensive docks and other works have been constructed, affording a convenient outlet for the surrounding wheat region. Pop. 101,463.

DULWICH (dul'ich). A suburb of London, in County Surrey, about 5 miles south of London Bridge, giving name to a parliamentary division of the borough of Camberwell; noticeable on account of its school, *Dulwich College*, called the "College of God's Gift," founded as a charitable institution in 1619 by the actor Edward Allen or Alleyn. Four parishes were benefited by the charity: St. Luke's, Middlesex; St. Botolph's, Bishopsgate; St. Saviour's, Southwark; and St. Giles', Camberwell. Having outlived its usefulness, in 1857 an Act was passed by which the college was reconstituted. It now consists of two branches, the educational and the eleemosynary, between which the surplus revenue is divided in the proportion of three-fourths to the former and one-fourth to the latter. Dulwich College is celebrated for its pictures, many of which were bequeathed by the founder; but the greater and more valuable portion of them was the bequest of Sir Francis Bourgeois, a landscape-painter, who died in 1810. The collection includes many fine pictures of the Dutch school.

DUMA, or **DOUMA.** The Lower House of the former Russian Parliament, the Upper House being the Council of the Empire. In 1905 Tsar Nicholas II. granted his country a Constitution, promising that responsible Government would be estab-

lished, and that no law would be made effective without the consent of the Duma. The first Duma accordingly met in 1906, and was to have had the power of a Parliament in Constitutional countries. The Legislative Assembly could make new laws, modify existing ones, issue the national Budget, etc., but had no right to alter the fundamental laws of the empire. In spite of the promises, however, given by the Tsar, the Imperial Government paid no attention to the demands of the Assembly, and when the criticisms of the Deputies became too loud, the first Duma was dissolved.

A second Duma assembled the next year, but its members, in consequence of governmental restrictions on elections, were mostly Conservatives. In the opinion of the Government, however, even the second Duma was too Liberal in its tendencies, and it was promptly dissolved. The third Duma, which met in 1907, and whose members were mostly landed proprietors, retired officers, and priests, was absolutely subservient to the autocratic Government, and, from that date to the outbreak of the Russian Revolution in 1917, the power and influence of the Russian Duma were almost nil. The Duma ceased to exist on 7th Nov., 1917, when the Bolsheviks came into power, and the Government of Commissaries of the People was set up.

DUMAS (dü-mä), **Alexandre** (called *Dumas Père*). French novelist and dramatist, born at Villers-Cotterets 1802, died at Puys, near Dieppe, 1870. He was the son of a republican general, and grandson of the Marquis de la Pailleterie and a negress, Tiennette Dumas. In 1823 he went to Paris and obtained an assistant-secretaryship from the Duke of Orleans, afterwards Louis Philippe. He soon began to write for the stage, and in 1829 scored his first success with his drama *Henri III. et sa cour*. It was produced when the battle between the Romanticists and the Classicists was at its height, and hailed as a triumph by the former school. The same year appeared his *Christine*, and in quick succession *Antony*, *Richard d'Arlington*, *Térésa*, *La Tour de Nesle*, *Catharine Howard*, and *Mlle. de Belle-Isle*. Dumas had now become a noted Parisian character. The critics fought over the merits of his pieces, and the scandalmongers over his prodigality and *galanteries*.

Turning his attention to romance, he produced a series of historical romances, among which may be mentioned: *Le bâtard de Mauléon*; *Isabelle de Bavière*; *Les Deux Dianes*; *La Reine Margot*; *Les Trois Mousquetaires*, with its continuations *Vingt Ans Après* and the later *Vicomte de Bragelonne*. His *Monte-Cristo* and several others are also well known to English readers through translations. Several historical works were also written by him: *Louis XIV. et son Siècle*, *Le Regent et Louis XV.*, *Le Drame de '93*, *Florence et les Médicis*, etc. The works which bear his name amount to some 1200 volumes, including about 60 dramas; but the only claim he could lay to a great number of the productions issued under his name was that he either sketched the plot or revised them before going to press. He earned vast sums of money, but his recklessness and extravagance eventually reduced him to the adoption of a shifty, scheming mode of living.

Alexander Dumas

His *Mémoires*, begun in 1852, present interesting sketches of literary life during the Restoration, but display intense egotism. In 1860 he accompanied Garibaldi in the expedition which freed Naples from the Bourbons. He died at the residence of his son, and was buried in Villers-Cotterets in 1872. Dumas was remarkable for his creative rather than for his artistic genius, and although he frequently squandered his gifts, he was admired even by the highly cultured, such as Thackeray and others.—BIBLIOGRAPHY: H. Blaze de Bury, *Alexandre Dumas: sa vie son temps, son œuvre*; A. B. Davidson, *Alexandre Dumas père: his Life and Works*.

DUMAS, Alexandre. Son of the above, born 1824, died in 1895, novelist and dramatist. His works treat mostly of the relations between vice and morals. His first novels, *La Dame aux Camélias* and *Diane de*

Lys, were very successful, as were also the plays which were founded on them. His dramas, which are much superior to his novels, deal satirically with the characters, follies, and manners of French society. He was thus a pioneer in the "comedy of manners." His plays, besides his dramatized novel, *La Dame aux Camélias*, which marked a date in the history of the French stage, and which supplied Verdi with the plot for *La Traviata*, are: *Le demi-monde*, *Le fils naturel*, *L'Ami des femmes*, *La princesse Georges*, and *L'Étrangère*.

DU MAURIER (dū-mō'ri-ā), **George Louis Palmella Busson.** Artist and writer, was born in Paris 1834, died in 1896. He was the son of an English mother and a Frenchman who had been naturalized as a British subject. At the age of seventeen he took up the study of chemistry in London, but soon adopted art as a profession. After studying in Belgium and France, he returned to London, and soon began to contribute drawings to *Punch*, *Once a Week*, *Cornhill Magazine*, etc. He succeeded Leech on *Punch*, and became famous chiefly through his drawings for that public cation. He also illustrated various books, and wrote three novels, *Trilby*, *Peter Ibbetson*, and *The Martian*. His elder son, Guy Du Maurier, born in 1865, killed in France in 1915, was the author of *An Englishman's Home* (1909)

DUMBAR'TON. A royal and parliamentary burgh and seaport, Scotland, chief town of Dumbarton county, stands on the Leven near its junction with the Clyde, 16¼ miles W.N.W. of Glasgow. Shipbuilding is carried on to a great extent, and there are foundries and engine-works. Dumbarton, since 1918, unites with Clydebank (Dumbarton District of Burghs), in sending a member to Parliament. Originally it was called Alcluyd, and it was capital of Cumbria or Strathclyde. Pop. (1931), 21,546. A little to the south is the famous rock and castle of Dumbarton, rising above the Clyde. The rock, which is of basalt, is 240 feet in height, and about 1 mile in circumference at the base. It is one of the fortresses stipulated to be kept in repair by the Act of Union, and the barracks contain accommodation for 150 men. There has been a stronghold here from the earliest times, and the fortress of Dumbarton occupied an important place in Scottish history.

Dumbartonshire. The county of Dumbarton is partly maritime, partly inland, consisting of two detached portions, the larger and most westerly lying between the Clyde, Loch Long, and Loch Lomond, and the far smaller portion being about 4 miles east of the former, and comprising only two parishes. More than half the area of the county is occupied by mountains, some of them attaining a height of upwards of 3000 feet. The lower lands are fertile, and in general well cultivated. More than one-half of Loch Lomond and fully two-thirds of the islands in it belong to Dumbartonshire.

The Gareloch, an arm of the Firth of Clyde, forms a part of the county into a peninsula. The principal rivers are the Leven, from Loch Lomond, and the Kelvin, both belonging to the Clyde system. The chief minerals are coal, limestone, ironstone, and slate, all of which are wrought more or less. On the banks of the Leven and elsewhere are extensive cotton printing and bleaching establishments; and there are extensive shipbuilding yards along the Clyde. Besides Dumbarton, the chief town, the county contains the towns of Helensburgh and Kirkintilloch, and the manufacturing villages of Alexandria, Renton, and Bonhill. Vestiges of the Roman wall of Antoninus still exist. The county returns one member to Parliament. Area, 157,433 acres; pop. (1931), 147,751.

DUMB-CANE. A plant of the ord. Araceæ, the *Dieffenbachia seguina*, of the West Indies, so called from its acridity causing swelling of the tongue when chewed, and destroying the power of speech.

DUMDUM. A military village and extensive cantonment, Hindustan, province of Bengal, 4½ miles E.N.E. of Calcutta. The village is famous as being the scene of the first open manifestation of the sepoys against the greased cartridges, which led to the mutiny of 1857. Pop. 12,000.

DUMDUM BULLET (so called from the arsenal at Dumdum, a small village 4½ miles from Calcutta), a hollow-nosed bullet which expands on impact, and so causes an ugly wound. It was used in Indian frontier fighting to stop the rushes of fanatical tribesmen. While the term "Dumdum" bullet should strictly only be applied to hollow-nosed bullets, it is popularly applied to any kind of expanding bullet.

Ordinary bullets can be converted into expanding ones by means of filing the cupro-nickel envelope until the lead core is exposed, by means of slitting the envelope at the shoulders, or simply by reversing the bullet in its socket. Expanding bullets are considered legitimate in big-game shooting, but in the Declaration signed at the Hague, 29th July,

1899, Germany expressly promised not to use such bullets in warfare. In spite of this the Germans freely used bullets of this kind in the European War.

DUMFRIES (dum-frēs'). Royal burgh, a river port, and until 1918 a parliamentary burgh, Scotland, capital of the county of same name, and the chief place in the south of Scotland; situated on the left bank of the Nith, about 6 miles from its junction with the Solway Firth. It is connected with the suburb Maxwelltown (in Kirkcudbright) by three bridges, one dating from the thirteenth century. It is a pleasing, well-built town, with various handsome public edifices. There are iron-foundries, hosiery and tweed factories, tanneries, and coach-building works. The River Nith is navigable to the town for vessels of under 60 tons, but the port has decreased in importance since the development of the railway system.

History. Dumfries is a place of great antiquity. The church of the Minorites which once stood here was the scene of the murder of the Red Comyn by Bruce in 1306. Burns spent his closing years here, and the street in which he lived now bears his name. His remains rest under a handsome mausoleum, and a statue of him was erected in 1882. Dumfries was the headquarters of the Young Pretender in 1745. Until 1918 Dumfries, Annan, Sanquhar, Lochmaben, and Kirkcudbright (the Dumfries burghs) sent a member to Parliament. Pop. (1931), 22,795.

Dumfriesshire. The county of Dumfries abuts on the Solway Firth, having on its borders the counties of Lanark, Peebles, Selkirk, Roxburgh, Ayr, and Kirkcudbright; area about 1072 sq. miles or 686,302 acres, of which about a third is under cultivation. The surface is irregular, but for the most part mountainous, especially in the north and north-west districts, where the hills attain a considerable elevation, some of them exceeding 2000 feet. The dales of the Nith, Annan, and Esk, the chief rivers of the county, contain fine pasture holms and good arable land. Oats, potatoes, and turnips are the most common products. Good cattle are reared, and are much in request for the English market. The sheep on the hill pastures are mostly Cheviots; on the lower and arable lands the Leicester breed prevails.

The minerals most abundant are coal, lead, iron, antimony, and gypsum. Coal and lead are worked to a small extent. Limestone and freestone abound in various parts. There are no manufactures worth mentioning. The county returns one member to the House of Commons. Its principal towns are Dumfries, Annan, Sanquhar, Lockerbie, Moffat, Langholm, and Lochmaben. Pop. (1931), 81,060.

DUMONT (dü-mōn), **Pierre Étienne Louis.** The friend and literary assistant of Mirabeau and Jeremy Bentham, was born at Geneva in 1759, died at Milan 1829. Ordained a minister of the Protestant Church in 1781, he attached himself to the democratic party in Geneva, and when the opposite party gained the ascendency he went to St. Petersburg in 1782, where he was appointed pastor of the French Reformed Church.

Soon after he accepted an offer to act as tutor to the sons of Lord Shelburne, afterwards Marquess of Lansdowne, which brought him to London, where he became intimate with Jeremy Bentham and Sir Samuel Romilly. Visiting Paris during the first years of the Revolution, he gained the friendship of Mirabeau, whom he assisted in the composition of speeches and reports, and of whom he wrote some interesting *Recollections*. On his return to London he formed that connection with Bentham which fixed his career as a writer; recasting, popularizing, and editing Bentham's works in a form suitable for the reading public. He returned to Geneva in 1814 and became a Senator.

DÜNA (dü'nä), or **WESTERN DVINA.** A river of Russia, which rises in the government of Tver, about 15 miles W. of the source of the Volga, falls into the Gulf of Riga, has a course of about 650 miles, and waters the seven governments of Tver, Pskov, Vitebsk, Mogilev, etc., draining an area of about 65,000 sq. miles. It is navigable for a considerable distance, but is frozen for about four months each year.

DÜNABURG (dü-'na-burg), or **DVINSK,** now known as **DAUGAVPILS,** a fortified town in Latvia, formerly belonging to Russia, in the government of Vitebsk on the right bank of the Dvina, 112 miles south-east of Riga. It carries on various industries, a considerable trade, and has three yearly fairs. The official name is Daugavpils. It was captured by the Germans in Feb., 1918. Pop. 43,226.

DÜNAMÜNDE (dü'na-mün-de; "Dünamouth"). A fortress and port on the Gulf of Riga, at the mouth of the Düna, having a large winter harbour for the shipping of Riga. Pop. 2500.

DUNBAR', William. The most eminent of all the old Scottish poets, was born, probably in East Lothian, about 1460-5. In 1475 he went to St. Andrews, where, in 1477, he took the degree of B.A., and two years later than of M.A. After this he seems to have become a begging friar of the Franciscan order, and made journeys in England and France, but he returned to Scotland about 1490, and attached himself to the court of James IV., from whom he received a pension of £10.

On the marriage of James IV. to Margaret of England, Dunbar celebrated the event in a poem of great beauty, entitled *The Thrissil and the Rois*. His pension was ultimately raised to £80 a year, and he was the recipient of various additional gratuities, though he appears frequently to have addressed both the king and the queen for a benefice, but always without success. After the defeat at Flodden his name disappears from the royal accounts, and he probably died about 1520.

Works. His works, which consist of elaborate allegories, satirical and grimly humorous pieces, and poems full of brilliant description and luxuriant imagination, first collected by David Laing (Edinburgh, 1834), were edited by John Small and Æ. J. G. Mackay, for the Scottish Text Society, between 1884 and 1893, and by Dr. W. Mackay Mackenzie in 1933.

DUNBAR' (Gael., Castle Point). A town of Scotland ; a royal and municipal (formerly parliamentary) burgh and seaport in Haddingtonshire, at the mouth of the Firth of Forth. It is a place of great antiquity, having originated in a castle, once of great strength and importance, which underwent several memorable sieges, on one occasion being successfully defended (in 1338) against the English for nineteen weeks by Black Agnes of Dunbar, Countess of March. In 1650, at the "Race of Dunbar," Cromwell totally defeated the Scottish army under David Leslie near the town. The harbour is not very commodious, but the town is an important fishing-station. Pop. (1931), 3751.

DUNBLANE'. An old episcopal city, Scotland, in Perthshire, 6 miles north-east of Stirling, on the Allan. The ancient cathedral, now restored, dates from the twelfth century. The nave is 130 feet by 58 feet, and the choir, now the parish church, is 80 feet by 30 feet. The building was restored in 1893. Bishop Leighton held the see from 1662 to 1670. About two miles from the town the indecisive battle of Sheriffmuir was fought in 1715, between the Royal forces under the Duke of Argyle and the Jacobites under the Earl of Mar. Pop. (1931), 2692.

DUN'CAN, Adam, Viscount. A British naval officer, was born in Dundee in 1731, died 1804. He went to sea when young, and was a post-captain in 1761. In the following year he served at the taking of Havana ; and in 1779 he shared in the victory of Admiral Rodney over the Spaniards. In 1789 he became rear-admiral of the blue, and in 1794 vice-admiral of the white squadron. The following year he was appointed commander of the North Sea fleet, and in Oct., 1797, won a brilliant victory over the Dutch fleet off Camperdown, for which he was rewarded with the title of Viscount Duncan of Camperdown and a pension of £2000 a year.

DUNCAN, Thomas. An eminent Scottish painter, was born in 1807, died at Edinburgh 1845. He studied under Sir W. Allan, and was elected an associate of the Royal Academy in 1843. His principal works were illustrative of Scottish history and character. Among the best known of them are : *The Abdication of Mary Queen of Scots, Anne Page and Slender, Prince Charles Edward and the Highlanders entering Edinburgh after Prestonpans, Charles Edward asleep in a Cave after Culloden*, and *The Martyrdom of John Brown of Priesthill*.

DUN'CANSBY HEAD. A promontory in Caithness-shire, Scotland, forming the N.E. extremity of the Scottish mainland, 1¾ miles E. of John o' Groat's House. and 18¼ miles N. by E. of Wick. Close by the promontory are two rocks, of fantastic form and great height, called the Stacks of Duncansby, which in spring and summer are covered with sea-fowl.

DUNDALK (dun-dak'). A seaport, Irish Free State, capital of the county of Louth, on Castletown River, about 2 miles above its mouth in Dundalk Bay. It has railway workshops, tan-yards, and a spinning-mill ; the trade, chiefly in cattle and agricultural produce, is extensive. It was the seat of the court of Edward Bruce from 1315 to 1318. In 1649 it was captured by Cromwell. Pop. (1926), 14,007.

DUNDAS' OF ARNISTON. The name of a family several members of which held a conspicuous place in the legal and political history of Scotland. —Sir James Dundas, the first of Arniston, knighted by James VI., was the third son of George Dundas

of Dundas, a descendant of the Dunbars, Earls of March.—His eldest son, Sir James, was member of Parliament for Mid-Lothian, and was appointed one of the judges of the Court of Session (1662).—His eldest son Robert was also raised to the bench of the Court of Session, and filled that station for thirty-seven years. He died in 1727.

His eldest son Robert (1685-1753), was successively Solicitor-General for Scotland, Lord-Advocate, member of Parliament for the county of Edinburgh, and Dean of the Faculty of Advocates. In 1737 he was raised to the bench, and on the death of Lord-President Forbes of Culloden, in 1748, he was appointed his successor.—His eldest son Robert (1713-87), also attained to the position of Lord-Advocate, and Lord-President of the Court of Session.—His brother Henry Dundas, Viscount Melville, distinguished statesman, was born in 1741 and died 1811. He obtained the post of Solicitor-General in 1773, that of Lord-Advocate in 1775, and was made joint keeper of the signet for Scotland in 1777.

In 1782 he was appointed Treasurer of the Navy and member of the Privy Council; and from that time took a leading part in all the Pitt measures, and had supreme influence in Scotland. Among other offices he held that of First Lord of the Admiralty; and in 1805 he was impeached before the House of Lords of high crimes and misdemeanours in his former office of Treasurer of the Navy, but was finally acquitted. He was created Viscount Melville in 1801, a title still borne by his direct descendant.

DUNDEE', John Graham of Claverhouse, Viscount. *See* GRAHAM.

DUNDEE (Gael. *Dun Tav*, fort on the Tay). A city, royal and parliamentary burgh, and seaport, Scotland, in the county of Angus, on the north shore of the Firth of Tay, about 8 miles from the open sea, 37 miles N.N.E. of Edinburgh; in population the third town in Scotland. It stretches along the Tay, or east to west, and of late years has been greatly extended in both directions. The more recently made streets are spacious and handsome, but most of those of more ancient date are narrow and irregularly built. The most conspicuous building is St. Mary's Tower, or the Old Steeple as it is popularly called, 156 feet high, erected in the middle of the fourteenth century. Three modern parochial churches have been built on to it in form of a cathedral, the nave, choir, and transept respectively forming a separate church.

Among public buildings are: the town hall, several public halls, the high school, exchange, infirmary, lunatic asylum, Albert Institute and free library. University College, for men and women, was opened in 1883, and affiliated to the University of St. Andrews in 1897. It was founded by private munificence, receiving an endowment of £140,000, and has ten professorships. Dundee has several public parks and recreation grounds and a good supply of water. The town has long been celebrated for its textile manufactures, particularly those of the coarser descriptions of linen, and it is now the chief seat of the linen trade in Scotland and of the jute trade in Great Britain, there being a great number of mills and factories engaged in the spinning and weaving of flax, jute, and hemp. Shipbuilding is extensively carried on, and there are large engineering establishments.

Dundee is also famous for its marmalade and other preserves and confectionery. The shipping accommodation includes five large wet-docks, with a connected tidal harbour and graving-docks. The chief foreign trade is with the Baltic and Archangel in the importation of flax and hemp, with Norway, Sweden, and Canada in timber, and with Calcutta in jute. The railway facilities of Dundee were greatly increased in 1878 by the opening of a bridge across the Tay; but on the 28th of Dec., 1879, the bridge was destroyed by a violent storm, when about 100 people in a train in the act of crossing lost their lives. A new bridge, to replace the one destroyed, was opened for traffic in June, 1887; it is a substantial structure about 2 m. in length.

Dundee was made a royal burgh by William the Lion about 1200, was twice in the possession of the English under Edward I., and was as often retaken by Wallace and Bruce. In 1645 it was besieged, taken, and sacked by the Duke of Montrose; and six years afterwards it was stormed by Monk, when a great number of its inhabitants were put to death. Since 1868 the town has returned two members to Parliament. In 1888 it was raised by royal grant to the rank of a city. In 1914 the burgh of Broughty Ferry was annexed to Dundee, increasing its area to 5964 acres. Pop. (1931), 175,583.

DUNDON'ALD, Thomas Cochrane, tenth Earl of. British admiral, was born in Lanarkshire 1775, died 1860. At the age of eighteen he embarked with his uncle, then Captain, and afterwards Sir Alexander Cochrane, in the *Hind*, of twenty-eight guns,

and soon distinguished himself by his daring and gallantry. In 1800 he was appointed to the *Speedy* sloop-of-war of fourteen guns, and in the course of thirteen months captured over fifty vessels, but was at last captured himself. In 1805, while in command of the *Pallas* frigate, he took some rich prizes, and for the next four years in the *Impérieuse* performed remarkable exploits in cutting out vessels, storming batteries, and destroying signals.

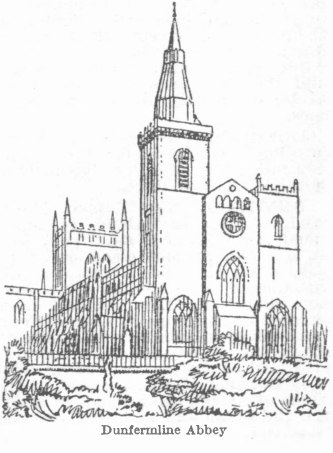
On his return to England he entered Parliament, and by his attacks on the abuses of the naval administration made himself obnoxious to the authorities. He gave further offence by charging Lord Gambier, his superior officer, with neglect of duty (which was true); by denouncing the abuses of the prize-court, and the treatment of the prisoners of war. His enemies succeeded in 1814 in convicting him on a charge—since proved to be false—of originating a rumour, for speculative purposes, that Napoleon had abdicated. He was expelled from Parliament, ignominiously ejected from the Order of the Bath, imprisoned for a year, and fined £1000. The electors of Westminster immediately paid his fine and re-elected him, but he had to remain in prison till the expiration of his sentence. In 1818 he took service in the Chilian navy, his exploits greatly aiding the national independence of that country, as well as soon after of Brazil. In 1832 he was restored to his rank in the British navy.

In 1831, by the death of his father, he had succeeded to the title of Earl of Dundonald; in 1841 he became vice-admiral of the blue; in 1848 he was appointed commander-in-chief on the North America and West India station; and in 1851 and 1854 respectively he became vice-admiral of the white, and rear-admiral of the United Kingdom. He was reinstated in the Order of the Bath (G.C.B.) on 25th May, 1847. He did much to promote the adoption of steam and the screw propelle in warships. He wrote an autobiography, which, though left incomplete, is a most interesting work.—Cf. J. B. Atiay, *The Trial of Lord Cochrane before Lord Ellenborough.*

DUNEDIN (dun-ē'din). Capital of the provincial district of Otago, New Zealand, and the most important commercial town in the colony, stands at the upper extremity of an arm of the sea, about 9 miles from its port, Port Chalmers, with which it is connected by railway. Though founded in 1848, its more rapid progress dates only from 1861, when extensive gold-fields discovered in Otago attracted a large influx of population. There are many handsome buildings, both public and private: the municipal buildings, the post office, hospital, lunatic asylum, Government offices, the university, high schools (boys' and girls'), the new museum, several banks (especially the Bank of New Zealand), the athenæum and mechanics' institute, the freemasons' hall, and two theatres. Wool is the staple export. Several woollen and other manufactories are now in existence. There is a regular line of steamers between this port and Melbourne, and communication is frequent with all parts of New Zealand. Through the opening of the new Victoria Channel from Port Chalmers vessels drawing 16 feet can now ascend to Dunedin at low water. Pop. (1932), 87,400.

DUNES. Low hills of sand accumulated on the sea-coasts of Holland, Britain, Spain, and other countries, in some places encroaching on and covering what once was cultivated land, but in others serving as a natural barrier to protect the country from the destructive encroachments of the sea.

DUNFERM'LINE. A royal and police burgh of Scotland, county of Fife, 3 miles N. of the Firth of Forth, and 14½ miles north-west of Edinburgh. The street, though narrow are well built. Dunfermline was early a favourite residence of the kings of Scotland, and at it were born David II., James I., Charles I., and his



Dunfermline Abbey

sister Elizabeth. The Benedictine abbey founded by Malcolm Canmore (1070) is now represented chiefly by the Abbey Church, in which are the remains of Queen Margaret and Canmore, Alexander I. and his Queen, David I., Malcolm IV., and Robert Bruce. Dunfermline was made a royal burgh in 1588.

The town has greatly benefited through the munificence of the late Andrew Carnegie, a native, who, besides other benefactions, settled on it the sum of £500,000. In the manufacture of table-linen it is unrivalled by any town in the kingdom. There are collieries adjacent. The Dunfermline burghs return one member to Parliament. Pop. (1931), 34,954.

DUNGAN'NON. A town of Northern Ireland, County Tyrone, 35 miles west by south of Belfast. It has manufactures of linen and earthenware. Till 1885 it returned a member to the House of Commons. Pop. (1926), 3760.

DUNGARPUR (dön-gar-pör'). An Indian native state in Rājputāna; area, 1447 sq. miles; pop. 189,272. —**Dungarpur** is also the name of the chief town and residence of the Maharawal of the state. Pop. 7327.

DUNGAR'VAN. A seaport, Irish Free State, County Waterford, on the Bay of Dungarvan, much resorted to for sea-bathing. The harbour is shallow, and the trade depends almost entirely on agricultural produce. Till 1885 it returned a member to Parliament. Pop. 5200.

DUNG BEETLE. A name applied to a large number of lamellicorn beetles (in which the antennæ terminate usually in lateral leaflets) from their habit of burying their eggs in dung. The *Geotrūpes stercorarius*, "dor" or "shardborne" beetle, and the *Scarabæus sacer*, or sacred beetle of the Egyptians, are examples.

DUNGENESS (dunj-nes'). A low headland on the S. coast of Kent, 102 miles S.E. of Rye; has a lighthouse with fixed light.

DUNKELD'. A small town of Scotland, on the Tay, about 14¾ miles north by west of Perth; pop. 946. It is a very ancient place, and from 850, when Kenneth I. removed the remains of St. Columba from Iona to a church which he had built here, became the metropolitan see of Scotland, till supplanted by St. Andrews. The choir of the ancient cathedral is still used as the parish church. Near it is Dunkeld House, the seat of the Duke of Atholl, the grounds of which are the finest and most extensive in Scotland.

DUNKERS, or **TUNKERS,** also called **DIPPERS.** A religious sect in America, founded by Conrad Peysel, a German, in 1724, and which takes its name from the Ger. *tunken*, to dip, from their mode of baptizing converts. They reject infant baptism; use great plainness of dress and language; refuse to take oaths or to fight; and anoint the sick with oil in order to hasten their recovery, depending on this unction and prayer, and rejecting the use of medicine.

DUNKIRK' (Fr. *Dunkerque*). A seaport town, France, department of Nord, at the entrance of the Straits of Dover, surrounded by walls, and otherwise defended by forts and outworks. It has several fine churches, a college, a public library, and a gallery of paintings; manufactures of earthenware, leather, soap, starch, ropes; sugar-refineries, breweries, and distilleries, and a large trade. In 1658 Dunkirk was given up to the English by Turenne, and continued with them till 1662, when Charles II. sold it to Louis XIV. It is one of the chief French torpedo stations, and during the European War was a British base and frequently bombed by the enemy. Pop. 31,000.

DUN'LIN. A British bird (*Tringa alpina*), a species of sandpiper, occurring in vast flocks along sandy shores. It is about 8 inches in length from the point of the bill to the extremity of the tail, and its plumage undergoes marked variations in summer and winter, the back passing from black with reddish edges to each feather, to an ashen grey, and the breast from mottled black to pure white. During the winter it migrates to Asia, Africa,

Dunlin, a species of Sandpiper

the Canaries, West Indies, and California.

DUNLOP, John Boyd. British inventor. He was born in 1840 at Dreghorn, Ayrshire, and for many years practised as a veterinary surgeon in Belfast. In 1887 he devised a pneumatic tyre which he patented in the following year, although an earlier form of pneumatic tyre had been the subject of a patent in 1846. In 1890 Dunlop sold his patent to William Harvey Du Cros (q.v.), and a company was formed for its commercial exploitation. The successor of this still bears his name, and Dunlop tyres are known all over the world. He died Oct. 23, 1921.

DUNMORE, Earl of. Scottish title borne since 1686 by the family of Murray. The 1st earl was Lord Charles Murray, a son of the Marquess of Atholl, who took his title from a village in Stirlingshire. William, the 3rd earl, fought for the Jacobites in 1745. Alexander, the 8th earl, won the V.C. in 1897, when Viscount Fincastle, a title borne by the eldest son of the earl.

DUNMOW', GREAT and LITTLE. Two villages, England, county of Essex. The latter is remarkable for the ancient custom, revived in 1855, of giving a flitch of bacon to any couple who, a year and a day after their marriage, could swear that they had neither quarrelled nor repented. The prize, instituted in 1244 by Robert de Fitzwalter, was first claimed in 1445.

DUN'NAGE. Faggots, boughs, or loose wood laid in the hold of a ship to raise heavy goods above the bottom to prevent injury from water; also loose articles wedged between parts of the cargo to hold them steady.

DUNNE, Finley Peter. American humorist, born in Chicago in 1867. After serving as reporter on various papers, he became editor of the *Evening Journal* (1897-1900). Dunne first attracted attention by a series of sketches in the *Times-Herald*, where he humorously commented upon all sorts of subjects in the name of one Martin Dooley, publican of Archey Road. His works include: *Mr. Dooley in Peace and War* (1898), *Mr. Dooley's Philosophy* (1900), *Observations by Mr. Dooley* (1902), and *Mr. Dooley Says* (1910).

DUNNET HEAD. A bold rock promontory in Caithness, with sandstone cliffs 100 to 300 feet high, the most northerly point of the mainland of Scotland, crowned by a lighthouse visible at a distance of 25 miles.

DUNNOT'TAR CASTLE. An extensive ruin on the coast of Kincardineshire, Scotland, on a precipitous rock rising from the sea. It dates from the close of the fourteenth century, and was long the stronghold of the Keiths, earls marischal. During the Commonwealth this castle was selected for the preservation of the Scottish regalia; and in 1685 it was used as a State prison for Covenanters. It was dismantled in 1720.

DUNOIS (dû-nwä), **Jean, Count of Orleans and of Longueville.** A French hero, natural son of Louis, Duke of Orleans, born 1402, died 1468. Dunois made the name "Bastard of Orleans" illustrious by his military exploits. He began his career with the defeat of Warwick and Suffolk, whom he pursued to Paris. Being besieged by the English, he defended Orleans until relieved by the Maid of Orleans. In 1450 he had completely freed France from the English, and was rewarded by the title of "deliverer of his country," the county of Longueville, and the dignity of High Chamberlain of France.

DUNOON'. A town, police burgh, and watering-place of Scotland, in Argyllshire, on the shore of the Firth of Clyde, 30½ miles by river from Glasgow. It extends for about 3 miles S.S.W. from the Holy Loch, and consists of Hunter's Quay to the N., Kirn and Dunoon proper to the S.; each with its separate steamboat pier. On a green rocky knoll are remains of the castle of Dunoon, once a residence of the family of Argyll. Pop. (1931), 8780.

DUNRAVEN, Earl of. Irish title held since 1822 by the family of Wyndham-Quin. It began with Valentine R. Quin, an Irish landowner who was made a baron in 1800 and an earl in 1822. He took the title of Dunraven because his son, Henry, was married to the heiress of Thomas Wyndham of Dunraven Castle, Glamorganshire. Henry became the 2nd earl in 1824. His son, Edwin, who became the 3rd earl in 1850, was a scientist and a spiritualist.

Windham, Thomas, who became the 4th earl in 1871, was a soldier and a war correspondent. Later he was prominent as a politician, especially in Irish affairs, but he is best known as a yachtsman, as he built yachts to compete for the America Cup. He died in 1926, and was succeeded by a cousin. The earl's eldest son is called Viscount Adare and his seats are Adare Manor, Limerick, and Dunraven Castle, beautifully placed overlooking the sea near Porthcawl.

DUNS, John, commonly called **Duns Scotus.** An eminent scholastic divine, born 1265 or 1274, but whether in England, Scotland, or Ireland is

uncertain. He was admitted when young into an institution belonging to the Franciscan friars at Newcastle, whence he was sent to Merton College, Oxford.

In 1301 he was appointed divinity professor at Oxford, and the fame of his learning and talents drew crowds of scholars from all parts. In 1304 he went to Paris, and was appointed professor and regent in the theological schools, in which situation he acquired the title of *Doctor Subtilis*, "the subtle doctor." He opposed Thomas Aquinas on the subject of grace and free-will; and hence the *Scotists* are opposed to the *Thomists*. Duns Scotus was the apostle of *realism*, which was opposed to the systems of *nominalism* and *conceptualism* promulgated by the other sections into which the schoolmen were divided. He died, it is said, at Cologne in 1308, leaving behind him numerous works.

He was a genuine scholastic philosopher, who worked out ideas taken from Aristotle, St. Augustine, and the preceding scholastics.—BIBLIOGRAPHY: W. J. Townsend, *The Great Schoolmen*; C. R. Hagenbach, *History of Doctrines*; E. Pʟuzanski, *Essai sur la philosophie de Duns Scot*; and article in *Dictionary of National Biography*.

DUNS, or **DUNSE** (dunz, duns). Police burgh and county town of Berwickshire, Scotland, on the Whitadder; has manufactures of linen, and paper-mills. Pop. (1931), 1788. On Duns Law (700 feet) are traces of a camp formed by Leslie's Covenanters in 1639.

DUNSIN'ANE. A hill in Scotland, one of the Sidlaws, 1012 feet high, about 7 miles N.E. of Perth, with vestiges of a hill-fort locally called Macbeth's Castle, and immortalized by Shakespeare in *Macbeth*.

DUN'STABLE. A town, England, county of Bedford, 33 miles northwest of London. It was an important Roman station, and had a palace and a priory founded by Henry I. in 1131. Part of the latter is used as the parish church. It has a grammar school, founded in 1715. Dunstable is famous for its manufactures of straw-plait. Pop. (1931), 8972.

DUN'STAN, ST. An English archbishop and statesman, was born at Glastonbury in 925, died at Canterbury 988. As a youth he was remarkable for his learning and his skill in music, painting, carving, and working in metals. He entered the Benedictine order, became an anchorite at Glastonbury, and in 945 was made abbot by King Edmund. After the death of Edmund, Edred, the next

St Dunstan

king, made him his Prime Minister and principal director in civil and ecclesiastical affairs. In the reign of Edwy he was banished, but was recalled by Edgar, and made Archbishop of Canterbury.

He was again deprived of power on the accession of Ethelred in 978, and devoted the last years of his life to his diocese and the literary and artistic pursuits of his earlier days. He did much to improve education and to raise the standing and character of the priesthood. The old biographies of him have all a large legendary element.—Cf. W. Stubbs (editor), *Memorials of St. Dunstan* (Rolls Series, 1874).

END OF VOLUME III.